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THE FARMER'S DIGEST

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Farmer's Digest
Fort Atkinson, Wisconsin

The Farmer's Digest

Volume 23 November 1959 Number 5

Cow Pools: Passing Fancy Or Dairy Revolution ?

Let's look at this dairy innovation seriously . . .

Condensed from
University of Minnesota Farm and Home News

WHAT'S the future of the cow pool in our dairy states?

Will it revolutionize the dairy business? Or is it just a talked-up idea that will soon be forgotten?

You can get "yes" answers to either question. And some will predict the outcome to be something in between. At the University of Minnesota, a group of extension specialists, economists and other research men feel that the pool probably won't become too important.

Reasons for these conclusions include low prices for milk, increased cost of forages for cow pools and management problems. Another reason is that many dairy farmers might have trouble finding as good a use as they now have for their land, buildings and working time if they send their cows to a pool.

A cow pool is a place where cattle owned by several farmers or other persons are kept, fed and milked. So far, the pools already operating in the Mid-west could be counted on one hand. But more than a dozen are in the planning stage around the nation.

There are many ways in which cow pools might be set up, but

Reprinted from University of Minnesota Farm and Home News, St. Paul 1, Minnesota

there seem to be four general types of arrangements:

* Cooperatively-owned pool, with the farmers hiring a manager and cow pool workers and with each farmer hauling feed to the pool and hauling manure away.

* Cooperative setup similar to the above, but with farmers pooling their labor and doing the work themselves.

* Privately-owned pool where farmers bring their cows in and are charged for all feed, housing, management and veterinary costs.

* Investor-type pool, where both facilities and animals are corporation-owned, and farmers and others simply own stock in the corporation.

The University men see these possible advantages in cow pools:

1. Opportunity for farmers to have working hours more comparable to industry. Most dairy farmers are tied to their job morning and evening for 365 days per year, often with little chance for vacation. Putting cows in a pool might give them an 8-hour day and more time off.

2. Specialized management for the dairy herd — including help from veterinarains and other specialists not always readily available on the home farm. These advantages might be particularly important for herds now producing at low levels.

3. A chance for some farmers now on grade B markets to get into grade A production without the required expense in buildings and facilities on the home farm.

4. For processors, a pool could furnish a large supply of top grade milk at one point, reducing transportation and other problems. It would help distributors simplify the entire milk procuring, processing and selling system.

Then flip the coin and there are several disadvantages:

1. Lack of other ways, in many cases, to market crops and labor if the cows go to a pool. If such a family can't market these crops and find other uses for the labor, a pool would have no advantages. Besides, while roughage, family labor and the equity in buildings and equipment are all marketed at the home farm these things must often be paid for in cash when cows are in a pool — but depending on the arrangement, of course.

It takes careful milking procedures to get all the milk from a cow.

2. Higher forage costs. If hay were the only roughage, each

cow would eat about 6 tons per year. Add the hauling cost to the market price for hay, and total cost would be some $50 per cow more than it would be for the same hay raised and fed on the home farm. The problem of transportation costs would be even greater if grass silage, corn silage or fresh green chopped material were used.

3. Management problems. Even with the best of farm managers in a pool, you would tend to lose the personal interest of cattle ownership. Unless member farmers haul their manure away, that is a problem too — probably meaning a fertilizer plant would have to be set up to dispose of the manure. Then there would be problems with mastitis and other diseases. Herd replacement might be difficult. Feed flavors, too, might hit milk from the entire herd in one day and affect a large supply of milk.

4. Low prices for mid-western farm milk. Most economists say

The lucky pedestrians are the ones who get the brakes.

a farmer would need to get at least $3.50 per hundred pounds for milk and have cows averaging 400 pounds butterfat — just to break even in most pools. That's figuring $2 per hour for labor and adding interest and cash costs Mid-western states milk prices aren't that high and average butterfat production is around 250 pounds per cow annually.

The importance of each good and bad point of a pool would again depend to a large extent on the arrangement. So how can a farmer decide whether a pool would be a good idea?

For one thing, he must remember that when he joins a pool, he becomes an investor. Yet, most dairy farmers are short on investment capital but long on labor. If they invest in cows and put the animals in a pool, they may have little or nothing left to invest in equipment and other livestock for the home farm. So in many cases they might be best off by actually selling the cows to the pool and, that way, getting capital to invest in working equipment. This, of course, would be simply shifting out of dairying entirely.

It might be possible for, say, a dozen farmers in one area, each with maybe 30 or 40 cows, to pool their cattle and forages and divide up their working time so each has a 5 or 6-day work week. But farmers doing this would have to get used to the idea of adjusting their desires to those of someone else and losing some independence. Would such a scheme work? Maybe not in

many places, but it's something to mull over.

The University men conclude that if cow pools are efficient enough to compete with farmers who keep their own herds, the pools will show up. Pools would no doubt be more efficient than the below-average herds, but probably wouldn't outdo the good dairymen. And even if they did compete, they would be no panacea for the small farmer — unless he has a good deal of capital and can find other profitable uses for his land and labor.

Population Predictions

Over 11,000 babies are born every day in the United States! In 1959 there will be over 4 million born. New official population predictions from the U. S. Census Bureau show that by 1984 we can expect to have at least 50 per cent more people in this country than we have now — over 275 million. Thus, there will be 50 per cent more consumers of food who will demand, roughly, 50 per cent more milk, eggs and meat than we now raise. —*Agricultural Memo*

STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC. REQUIRED BY THE ACTS OF CONGRESS OF AUG. 24, 1912, AND MARCH 3, 1933, AND JULY 2, 1946, of the Farmer's Digest, published 10 issues a year at Fort Atkinson, Wis., for November 1, 1959.

State of Wisconsin
County of Jefferson
ss

Before me, a Notary Public in and for the State and County aforesaid, personally appeared Hugh Highsmith, who being duly sworn according to law, desposes and says that he is the publisher of the Farmer's Digest and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management, etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, as amended by the Act of March 3, 1933, and July 2, 1946, embodied in section 537, Postal Laws and Regulations, to wit:

1. That the names and addresses of the publisher and digest editor are: Publisher and editor, Hugh Highsmith, Fort Atkinson, Wisconsin.

2. That the owners are: The Highsmith Co., Inc., Fort Atkinson, Wisconsin; Hugh Highsmith Fort Atkinson, Wisconsin.

3. That the known bondholders, mortagees and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages or othe rsecurities are: None.

Signed, Hugh Highsmith, Publisher.

Don Wittenwyler, Notary Public. (My commission expires October 6, 1963.)

Sworn to and subscribed before me this 26th day of October, 1959. (Seal).

How Long Will The Slump Last?

The outlook is poor for the next three years if we force our surplus feed grains into more poultry, hogs, and cattle . . .

Condensed from Capper's Farmer

Francis A. Kutish

WHAT happens to hogs in the next 3 years may have a lot to do with writing the future farm program. We may be in for a long stretch before prices ride above the $15 level again.

Midwest farmers have been living below a price protection dam. Behind the dam is stored our huge feed-grain surplus.

The dam is threatening to break and release the full flood of our surplus feed-grain production into expanded livestock numbers and into various livestock products.

We've produced more feed grains than we have fed each year for the last 6 years. The excess has been impounded and stored under the CCC loan and price support program.

Cost of storing the feed-grain and wheat carry-over has become a favorite topic of editorial criticism by city newspapers and magazines. The stockpile has grown so large that government-paid storage is losing favor as a method of taking up the slack between production and consumption.

This stockpile had a total of 70 million tons by last October 1. That's 50 million tons more than the normal carryover of 20 million tons. It includes a half year's corn crop.

We can grasp the size of 50 million tons of feed grain when we recognize that it is enough to feed an average annual pig crop. It is five times as much as our record 1957-58 feed-grain export.

Pressure is on to use up the feed-grain surplus by raising more hogs and poultry and feeding more cattle. But more livestock production means lower prices and reduced incomes for Midwest farmers and stockmen.

What will happen if we try to catch up with our present rate of grain production by expanding livestock over the next 3 or 4 years? Livestock producers certainly would suffer painfully around their pocketbooks. And if, in the same period, government bins were emptied of corn,

Reprinted by permission from Capper's Farmer, Topeka, Kansas

and wheat were put in competition with feed grains, they might feel an income pinch as painful as that experienced back in the thirties before the days of farm programs.

What actually happens to livestock prices will depend upon weather, our general level of prosperity, and the kind of farm program we have over the next few years.

Suppose we have average weather, continued improvement in general economic activity, and no change in our present farm program — what can livestock farmers expect? As we see it, we will continue boosting livestock output, but not enough to use all our feed-grain crop. By 1962 we will have added 12 to 13 million tons more to our feed-grain carry-over.

Biggest output boost will be in hogs. Altho hog prices are lower this year, cheaper feed will encourage further hog expansion into 1960. Prices are likely to be down to the 10-12 cent level by the latter part of 1960. Cash receipts from hogs in 1961 may be down 33 percent from 1958.

Such a drop probably will cut back spring farrowings in 1961. So, there should be some price recovery in late 1961 and 1962. But cheap feed will discourage any large reduction in numbers and dampen the price rise.

Hog growers must also face the consumers' declining taste for pork. Pork consumption does not gain from increasing population as do beef, poultry, and other livestock products.

*Outlook for cattle is more fav*orable than for hog growers over the next 3 years. Beef prices this year are averaging higher than last year. But numbers of cattle and calves are expanding. By 1960 beef supply will be increasing, and prices will begin to work lower. Prices will slip further in 1961. Beef output will be rising rapidly by 1962 or 1963, and prices will be skidding sharply.

The time to debeak pullets if cannibalism is a problem, is when you house them. Electric debeakers can often be rented from hatcheries or poultry supply stores.

*Look for sheep numbers to fol*low the same trend as cattle but at a slower rate, since expansion will not be as sharp.

Next to hog owners, poultrymen face the toughest road. We will see significantly lower poultry and egg prices over the next 3 years than we had in 1957-58. Cheaper feed and downward pressure on farm income will encourage more egg production. Likewise, cheaper feed will sup-

port expansion in broilers and turkeys.

What happens to dairy income depends upon the government program. If dairy supports are held at 75 percent of parity, income from milk and butterfat probably will work higher. Abundant low-priced feed and less income from hogs and beef cattle will encourage expansion of milk production.

What are the prospects for the cash-grain farmer? Prices of feed grains will follow closely the corn support program. Support prices

Adding a fungicidal chemical to asphalt varnish used in painting tree wounds prevents growth of fungi that cause decay in shade trees.

are expected to drop slightly in 1960 and 1961 as the 3-year-market-price-average feature of the law comes into effect.

In years of excess supply, market price of corn has averaged below the loan rate. This situation is likely to continue thru 1959-61. If the anticipated cutback in hog numbers comes in 1961, we will feed less corn that year. Therefore, corn prices likely will slip further below loan levels in 1961 and 1962.

Looking at the over-all grain and livestock farming picture for the next 3 years, we see total cash receipts from sales of feed grains, livestock, and livestock products running 4 to 6 percent below the 1958 level. The bad hog prices anticipated for 1960 make it the lowest farm income year in prospect for the 3-year period.

Effects of the income drop will vary farm by farm. If you are a hogman operating near full capacity, you will suffer a greater

In the first three months it was open, 1,500 motorists ran out of gas on the Indiana Toll road.

percentage of income drop. If you can expand operations, you can use increased volume of output to offset some of the price decline.

Crop incomes will depend upon weather, with the CCC loan program serving as a price stabilizer. Meanwhile, we can expect a continued rise in farming costs. This will bring a much sharper drop in net farm income.

We believe farm income prospects — at least for the coming 3-year period — indicate that pressure for new farm programs will remain strong. Farm policy and farm legislation will rate high in the news in the next few years.

What Is A Dollar Worth?

An answer to the age-old cracker barrel discussion question . . .

Condensed from Business Conditions

DISCUSSIONS of inflation commonly include references to "the declining value of the dollar."

In recent months it has been said frequently that "the dollar is worth only 48 cents." This statement means that a dollar will purchase only 48 per cent as many commodities and services at the present time as it would in 1939, as measured by the consumer price index.

It is self-evident that the value of a monetary unit is determined by the quantity of goods and services it can command in exchange. As prices rise, the purchasing power of a dollar declines; as prices fall, its purchasing power rises.

When individual commodities are considered, the value of the dollar does not ordinarily come to the fore. We may note, for example, that wool was priced recently at 43 cents per pound and that a year earlier the price was 36 cents. But we do not think of the dollar as being worth 2.3 pounds of wool, and we do not conclude that the dollar has declined nearly 20 per cent during the past year merely because the price of wool has risen. It is true, in a sense, that there are as many values for the dollar as there are commodities. However, movements in these prices are often quite different. For example, the prices of many agricultural commodities and imported raw materials are substantially lower than they were in 1947. Prices of most other things are higher, but by varying proportions.

To be useful, the idea of a shifting purchasing power of money must be related to changes in the prices of a wide variety of commodities and services. To measure the change in the values of the dollar, then, requires the computation of an average of many prices. Usually the prices of the individual items are weighted according to their relative importance.

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Even the broadest measures of the price level do not attempt to include all prices. Secondhand items, stocks and bonds and real estate prices usually are not included.

To facilitate making comparisons of groups of prices through time, price indexes are constructed. The average of prices as of some specified date — the "base period" — is taken to be equal to 100. The average computed for other dates is presented as a percentage of the base. The base period may be a year or even a shorter period, but it is common to use an average of several years. At the present time, many indexes use the 1947-49 base period. The selection of the base period is merely for convenience in making comparisons. It does not indicate, necessarily, that the relationships which existed during the base period were more normal, reasonable or desirable than those in any other period.

Prior to the time when the 1947-49 base period came into fairly general use, 1935-39 was widely used. In the future, other base periods will be used.

The most widely used indexes of prices are the *consumer price index,* which measures changes in the prices of goods and services purchased by families of urban wage earners and salaried clerical workers, and the *wholesale price index,* which measures changes in the prices paid by business firms in the primary markets. A third measure, and one that is coming into more general use, is the *gross national product deflator.* This index is the result of efforts to remove the effects of price movements from estimates of total spending so that the estimates of total output of the U. S. economy can be presented in "real" terms.

When a value is assigned to the general purchasing power of the dollar, it is derived from one of these measures which represents changes in a broad category of prices. The statement that "the dollar is worth 48 cents" is based upon the over-all rise in the consumer price index since 1939. If the wholesale price index were used for this purpose, it would be said that the dollar was worth 42 cents. According to both indexes, therefore, the value of the dollar has dropped by more than half since 1939, or, to put it in another form, prices have more than doubled.

The average watch ticks 5 times per second.

The following table shows the different "values" (May 1959) of the dollar which result from using different "base" years for the consumer and wholesale price indexes.

Base period	Current purchasing power relative to the base period CPI*1	WPI*2
1913	34c	38c
1920	69	83
1929	59	52
1933	45	37
1939	48	42
1948	83	87
1953	92	92
1958	100	99

*1 Consumer Price Index
*2 Wholesale Price Index

When reference is made to a "48 cent dollar," it is desirable to keep in mind several important qualifications. For example, is the particular price index employed the most reasonable one available for a particular purpose? No index will accurately represent the purchases made by a given individual or firm. In this sense, everyone has his own price level or purchasing power of the dollar.

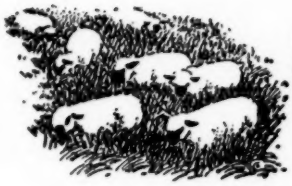
Another problem is encountered when price indexes are used for purposes which require a high degree of precision. For example, the fact that the consumer price index declined or rose a tenth of a point in a given month is often offered as front page news. Those who construct such indexes hardly ever claim such a high degree of accuracy for their product. If the consumer price index were "rounded" to the nearest full percentage point, it would be unchanged from April 1958 through May 1959, the latest figure available.

Other problems are presented by the difficulty of obtaining accurate price quotations in periods of scarcity or abundance. Under such circumstances, special concessions may significantly affect prices actually paid even though list prices remain relatively stable. Another difficulty is encountered in periods, such as 1946, when many kinds of goods are not available in usual qualities and styles.

Comparisons of price movements over long periods of time involve additional difficulties. This is because of the introduction of new products, changes in the characteristics of existing products and changes in the proportions of income spent in various ways. No method has been developed to allow for new products and quality improvements in price indexes.

The limitations discussed above do not mean that available measures of the purchasing power of the dollar are without significance. They provide, in a general way, a means of evaluating the nation's success or failure in combatting inflationary pressures. Their limitations are most troublesome when precise measurements are desired.

What's Ahead For Sheepmen?



Lamb feeders will be better off than ewe-flock owners in the year ahead . . .

Condensed from The Farmer

Gilbert Gusler

THE year ahead looks less favorable for the lamb grower but better for the lamb finisher. Lamb prices probably will average a little lower. Wool supports will be unchanged, at least until March 31. Total production costs will be about the same.

This year's lamb crop tallied 21,108,000 head, up 2% from last year and largest since 1948. However, it is a small crop compared with those of the 1930's and early 1940's. The trend of lamb production has been up since 1950 but only slightly more than population growth.

Growers will sell more closely this fall than last year. Commercial slaughter in the last five weeks was 6% greater than a year previous. Drouth in the northern Great Plains and western states is forcing more extensive marketing from that area. Even in central and eastern states where feed is plentiful, lower prices in the last eight or nine months have chilled the urge to add to flocks. Additions to flocks this year will likely be smaller than either of the last two years.

Supplies next winter will depend mainly on feeding operations. Last season's winter feeding results were disastrous to many finishers. Confidence was high while feedlots were being filled. Feeder lamb prices in July-November, the period of largest purchases, averaged slightly over $22 a cwt., the highest in five or six years. Soon after the feedlots were filled, the fat lamb market went to pot and finishers sold at a national average of less than $19.

More Lambs in Feedlots

In spite of that experience, finishing operations may be slightly larger this season. More lambs in feeder flesh will be available, and they are priced $3.-3.50 a cwt., lower than last fall. Scarcity of local feed may limit lamb feeding in parts of the West, but the Corn Belt, Texas

Reprinted by permission from The Farmer, 55 East 10th Street, St. Paul 1, Minnesota

and Oklahoma are well supplied. Conditions in the wheat-pasture areas appear favorable, although not quite as good as in 1958.

Because of last year's sad experience, finishers have been cagey about contracting feeder lambs for fall delivery, but are likely to buy more actively when they feel sure about feed supplies and probably will end 1959 with more in feedlots than a year ago. If that proves to be the case, more fed lambs will be marketed in the first three or four months of 1960 than in the same period of this year.

Lamb supplies in late spring and summer next year will depend on the size of the early new crop. In view of the large number of ewe lambs held back last year and two years ago, it seems likely that more yearling and older ewes will be on hand at the start of 1960 than a year earlier, so that the total lamb crop is likely to be a little larger next year. Feed conditions this fall are likely to be unfavorable for the early crop in California and Arizona, but quite favorable for those in most other areas, according to forecasts.

Not only are domestic supplies of lamb and mutton likely to be larger in the year ahead, but consumers will be offered more pork and probably a little more beef, veal and poultry. Imports also are likely to be larger.

More Imports Expected

In the first six months of 1959, imports of lamb and mutton, mostly from Australia and New Zealand, totalled 32 million pounds against 11 million pounds a year previous. Those imports were equal to 9% of the lamb and mutton from domestic commercial slaughter. Since flocks in Australia and New Zealand are larger than ever, competition from imports probably will continue greater than a year previous.

On July 28, a shipment of 23,629 live lambs, and yearlings from Australia landed at San Diego from a converted passenger liner. They were being held in 30-day quarantine. Over 2,000 were lost during the voyage. Cost in Australia was $6.-6.75 a cwt. If the shipment proves profitable, the shipper plans to send 200,000 in the next year, which would add over 1% to commercial slaughter in the United States.

Increasing population and rising consumer incomes would indicate better demand in the year ahead. However, demand for lamb in the last year or two has been disappointing. Although lamb supplies per person have been moderate, rather low lamb prices have been necessary to move the supply into consumption in spite of the rise in prices

for beef and veal, traditional competitors of lamb. These low prices have prevailed despite several years of consumer promotion work by the American Sheep Producers Council. Perhaps lamb suffered more than some other meats from competition of cheaper poultry. Whatever the influences are, demand probably will be at least as good in the year ahead.

Lamb prices probably will work somewhat lower in the next two months as supplies of lambs and meat animals increase. They are likely to stay on the lower level until late fall. Because of shortage of forage for wintering livestock in much of the West, some reduction of flocks and herds appears necessary. This may mean a low late fall market. Prices will hold better for feeders than for fat lambs.

In view of this history and prospects of larger supplies of fed lambs, possibly greater imports and more competition from other meats, Chicago prices in the next December-April period are not likely to average much over $20. Pelt values will be higher because of the rise in wool but the wool compensating payment probably will be about a fourth lower than last season, or roughly 75 cents a cwt.

Feeder lamb prices are hardly low enough yet to be safe for the prospective fat lamb price level. At Omaha, good and choice feeders now average about $19.-50 a cwt., making the cost of a 70-lb., feeder around $13.65. Allowing 2½ bushels of corn at $1 a bushel and 150 lbs., of hay at $20 a ton, or their equivalent in other feeds for a 25-lb. gain, feed cost probably will run around $4 a head. It will be less, of course, for finishers able to use much fall pasture. Then, in figuring feeder prices at Omaha against fat lambs at Chicago, finishers need an additional $2 or more a head to cover transportation, other marketing costs, labor, other expenses and death loss, less credits for manure.

The United States has 7 per cent of the world's total population.

Range Lambs in Early

That makes the needed minimum return from a 95-lb., fat lamb to be $19.65 a head, or about $20.65 a cwt. If the finisher's share of the wool compensating payment is 20 cents a cwt., the needed minimum price would be $20.45 a cwt.

In view of the price outlook, close selling of grass lambs on small price rallies in early fall looks best. Many western lambs will have to be sold when they move down from high summer

ranges, where feed has been good, to fall and winter ranges where feed is short. But growers in other areas might as well go to market as soon as their lambs are at good weight and well finished. For late and thin lambs, it will be well to provide good pasture or a little grain to hasten finish, or feed them in drylot. Shearing will lower the cost and speed the rate of gain.

Finishers should try to get good and choice feeder lambs at $19 or less. Light lambs, if thrifty and growthy, are worth a premium. Late fall purchases are likely to be cheapest this year, but gains on fall pasture will reduce the cost of early buys. Lambs fattened for the early-fed market are likely to be less profitable than those bought late and finished for midwinter and later markets. Antibiotic and hormone feed additives and pelleted feeds are aids to fast, safe and low-cost gains.

Growers of new-crop lambs for market next spring and summer probably should figure on an average level of prices slightly lower than this year's. Supplies probably will be a little larger and competition from other meats will be greater.

Farmers who contemplate starting a flock may find good opportunities to acquire breeding stock this fall while range growers are selling down in line with their feed supply. Returns from flocks in the next two years probably will compare more favorably with beef cattle and hogs than in the last two years.

A Formula For Figuring Value of Feeder Pigs

When you buy feeder pigs, keep this in mind:

You need to buy each pig for $20 less than you expect to get at market time, if you want to make a $2 profit on the animal.

Now suppose you pay $10 for a feeder pig. You'd have to get at least $15 per hundred for the porker at market weight to make the $20 margin.

For every dollar above $10 which you pay for feeders, the market price must increase by 50 cents to make the same return. So if feeder pigs cost $12 each, you need to get $16 per hundred at market weight, to reach the $20 margin level.

This way of figuring is based on average quality pigs, marketed at around 200 or 210 pounds, according to Paul Hasbargen, farm management specialist at the University of Minnesota. It is also based on feed costs of about 9 cents per pound. —*The Berkshire News*

Help Your Son Start Farming

A father-son agreement will often pave the way to farm ownership for a young man . . .

Condensed from Pennsylvania Farmer

Fred Hughes

EACH year more farm families are asking their county agent or Vocational Agriculture instructor to help them draw up father-son partnerships. There are several reasons for this interest.

(1) Capital: The high capital requirements of today's agriculture makes it next to impossible for a young farm family to start farming without help. A father-son partnership is probably the best alternative for this help.

(2) Labor: With farm businesses becoming bigger, a shortage of competent farm labor makes it more important for Dad to keep a son at home. If the son stays home, he wants responsibility and opportunity to build personal equity as he may do in some other endeavor. The son feels an agreement is essential to insure his future on the farm.

(3) Security: Mother and Dad can now look forward to social security for income in later years, so they are more willing to bring a son or son-in-law into the business. The son eventually will take over the entire operation.

(4) Inheritance: A fourth reason for a partnership are the legal problems of today's society. A son staying home to help farm without a partnership agreement will help build his fathers' estate. If the inheritance is divided between the heirs, this is unfair to the son who remained home.

Certainly a father-son partnership offers the best opportunity for a young farm family to get started. There are several points to consider in drawing up a partnership agreement.

Put it in Writing

The most important point of any agreement is that it should

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be in writing. There are presently too many oral agreements. It is preferable that this agreement be drawn up by an attorney. The legal problems involved in estate settlement can be handled by your attorney, therefore he should be acquainted with the family situation.

I remember a case of a 55-year-old farmer in Ohio that came into my office in tears. He could never get his father to draw up a written agreement. His father died at age 80, and four brothers and sisters were going to share equally in the equity in the farm, livestock and equipment the son helped develop with his labor. Legally the son could do nothing about this situation. Equitable settlement in cases of this type would require understanding brothers and sisters. Too often the greed for money overshadows this understanding and causes a life-long rift in an otherwise happy family.

Division of ownership is an important point to consider. Usually the ownership of real estate is not involved in the first partnership agreement between a father and son. There may be other children involved, or a son does not have equity to buy part of the farm. The son enters the business with ownership in livestock and equipment. How will this ownership be divided, and how will the son pay his share?

Make an Agreement

When there is only one son who wants to farm, I personally recommend a 50-50 ownership in livestock and equipment. If there are two sons, a 1/3-2/3 agreement can be used; or if there are three sons, a 1/4-3/4 agreement is used. When Dad retires from the business, the son or sons buy his share of the farm assets.

Usually a son does not have money to buy his share of the livestock and equipment. Rather than gain ownership a little each year, I prefer the son to buy his agreed-on share immediately.

The father can hold a note covering the son's share, payable over a specified period at a specified interest rate. This means the son borrows money from his father just the same as from a credit institution.

He who said, "Only time will tell' evidently didn't know many women.

For example, assume the value of livestock and equipment is $20,000, and the partnership is a 50-50 share. The father would issue the son a note for $10,000. This could be paid to the father over a five-or ten-year period from the son's wages or from

profits. A record of payments would be given the son by the father. This provides legal proof of the son's ownership in case of the father's death. It immediately gives the son a feeling of security and equal responsibility in the management of the farm.

Monthly wages should be agreed on for members of the partnership. These wages are paid out of farm income just the same as the feed or fertilizer bill. In setting wages, consideration should be given to the health and availability of each party. If they are to contribute equal amounts of labor, they will be paid equally. The wage agreed on should be enough to cover monthly living expenses. As an example, I might suggest $200 a month. All hired labor is paid from partnership funds.

Mastitis control depends on good management and strict sanitation. Treatment should be a minor part of the program.

If the father retains full ownership of the farm, he should have the privilege of charging a reasonable rent figure to cover interest on investment. This could be three or four per cent on the value of the farm. All taxes, insurance and repairs will be paid from partnership funds.

Permanent Improvements

Permanent improvements to the farm, such as barn remodeling or a new silo, can be handled in several ways:

(1) The father pays for all improvements from his income, in which case the value of the farm increases for purposes of determining the rent the father receives.

(2) The improvements are made from partnership funds. If this is the method used, the son should receive a non-interest bearing note from his dad to show his share invested in farm real estate for purposes of estate settlement.

(3) The improvements are made from partnership funds and the son is given an option to buy the farm at an agreed-on price plus the father's share of improvements, less the depreciation of the improvements. The attorney should prepare the option papers.

The partnership should provide for a joint bank account with all operating expenses paid from this account. Each partner should have their individual bank accounts for personal use. This eliminates the chance for spending beyond a family's income, especially from the farm account.

The profits, after paying the labor of father and son, the fath-

er's rent, and all current operating expenses, are divided equally between father and son.

The father, mother, son and son's wife should have their attorney draw up individual wills in addition to the partnership agreement. This protects all parties to the agreement, in addition to providing for other childen in the family. It also eliminates the chance for family discord or unhappiness in future years.

Father-son partnership agreements started now will insure the transfer of our good farms to the younger generation. It will also preserve the tradition of sound family farms in our agriculture. Your county agricultural extension agent or vocational agriculture instructor will be happy to discuss a father-son partnership for your farm.

Plain Talk

"I sometimes wonder," said Vermont's Senator George Aiken, "if the critics of farm programs really know what it is they are attacking.

"It is not the farmer so much as it is the public that would pay dearly if farm programs were abolished . . . Even a slight food shortage would result in skyrocketing consumer prices.

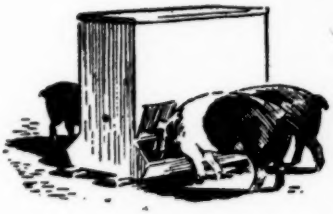
"The greatest stabilizing influuence of the world's economy today is U. S. agriculture. Take away our assurance of plenty of food and chaos could result. . ."

The above excerpts are from a speech in defense of agriculture delivered recently on the Senate floor. —*Tuesday Letter*

Stick fast to your good long-time plans for your land, livestock, and building. We are past the day of high profit per head of cattle fed, per hog, per bushel of corn, or bushel of beans raised. It is now a matter of much less profit being made on each head of cattle or hogs, on each bushel of corn or beans and making a good over-all profit by having a larger volume. So don't jump around, but rather, hold or keep gradually increasing volume of production. If you think you can outguess a market do it on the Chicago Board of Trade Grain market or in the Chicago Stockyards, as a speculator, where you can make lots of money fast — if you are good at it.

—*Dowell Farm Facts*

Raising Hogs On Concrete



Total confinement and multiple farrowing are becoming general practices . . .

Condensed from
National Livestock Producer

E. L. Quaife, Iowa State University

CONFINEMENT of hogs from birth to market on concrete is replacing the pasture-raising system on many Corn Belt farms.

Smaller hog producers are following the lead of the larger operators in establishing faster, more efficient systems of hog raising.

By switching to confinement, hog men can return valuable land to crops; increase herd size; reduce labor needs; control disease better; feed more efficiently, and through multiple farrowing in farrowing houses under controlled conditions they can market hogs the year round; evening out the high and low periods and getting a higher average hog price.

There are many combinations of what we call "confinement" or "raising hogs on concrete." three common variations found today are the following:

● Max Bailey's operation near Ames, Iowa. Here is a producer who has gone "whole hog" into confinement. He farms 190 acres of highly productive land worth far more in crops than used as hog pasture. Bailey built a 34-stall farrowing house, a nursing house, and a 56' x 160' enclosed finishing house. He raises about 3,000 head of hogs annually, with farrowing about every six weeks. The pigs are weaned at three weeks of age and moved to the nursing house where they remain until they weigh about 40 lbs. They are then transferred to the finishing house, and fed to market weights in bunches of 40 to 50.

● Bernard Collins' partial confinement system. Collins, vice president of the Iowa Swine Producers Assn., farms 600 acres near Clarion, Ia., and raises 2000 hogs a year. For years he put his January and February pigs to pasture in April and fed them out on pasture. Today he says

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"My land has become so valuable for crops that it doesn't pay to pasture my winter pigs, so I have built a finishing floor and feed them out in confinement. My summer pigs are farrowed in the field and I use them to glean the cornfields. Then I bring them to the floor to be finished."

Farrowing Pattern Changing

● Val Racek's converted barn program. Racek's farm is south of Ames, Ia. Here, he added a concrete floor to an old barn and put a 900 square foot concrete apron in front. He has his farrowing pens around the inside wall of the barn. His feed comes down through chutes from the floor above. The water is piped up through the floor inside. Racek put only $300 in this layout, which is tops for raising 150 hogs a year.

Fifty-four per cent of all employed people in America work in jobs that did not exist 50 years ago.

Many other farmers who want to feed out 75 to 150 hogs in confinement are following Racek's method. Most producers have sheds and feeding floors which they can convert to concrete with very little outlay.

Top hog men are looking to multiple farrowing and confinement raising as the way to beat the present boom and bust hog cycle. The normal pattern in hog farrowing has been twice a year, Spring and Fall with the Spring farrowings the largest. Thus a producer who farrows sows in the Spring will hit the low prices in October November and December. Twice a year farrowing improves the average yearly price but multiple farrowings of four or more times a year means that market peaks and valleys are ironed out and the producer obtains a higher average price.

The growing popularity of increased farrowings is evident in Iowa, where December, January and February pigs made up 26% of the total 1958 spring pig crop. This is something new; until recently, lack of heat and housing facilities prevented the raising of winter pigs. Producers, like Collins, who farrow early litters, find that it doesn't pay to put pigs on green, washy pasture — it actually slows up the rate of gain. So they crowd the pigs along for a late May or June market.

Confinement vs. Pasture

Multiple farrowing has many other advantages besides a better marketing program. Many farrowings mean fewer sows are farrowing at one time, which results in uniform labor requirements; less danger of being wiped out in

an epidemic; constant use of buildings and equipment; more efficient use of a production tested boar of good meat type, and a uniform hog crop which can be marketed at desirable weights without the tendency to hold back and hope for an increase in price.

We know how to feed hogs in total confinement today so that they will do just as well — and most times better — than on pasture, even the best pasture. Arguments advanced in favor of pasture are the experiments which show that an average of $20 of feed is saved by an acre of pasture. However, so much pasture becomes hard and dry during the summer that hogs gain very little during such periods. And when it rains, much hog pasture becomes mud. It's far better to use pasture for returning $50 an acre and more from row crops.

Comparison of pasture and total confinement has been given a good trial in the boar testing stations. Results at the Iowa station have shown that 2,200 pigs put on test at 60 lbs. have gained about 1.85 lbs. daily on an average of about 300 lbs. feed per 100 lbs. gain. The pigs had about 14 square feet of floor space each, including sleeping and feeding area. About 6 to 8 feet of sleeping space and 10 feet of feeding and watering floor are sufficient.

The Indiana Experiment Station compared finishing hogs on a good alfalfa pasture with hogs fed the same well-balanced ration in confinement. The hogs fed free choice in dry lot gained an average of 1.64 lbs. daily against 1.57 lbs. for those on pasture. The hogs in confinement required 310 lbs. of feed against 299 lbs. by those on pasture. Pasture in this case had a value of $15.84 per acre, hardly consistent with its value for corn.

Meat production in 1959 has been estimated at 27 billion, 200 million pounds, the second highest on record. The top year was 1956, with 28 billion pounds.

However, this does not mean that a farmer who uses pasture efficiently should discard his program in favor of confinement. There are areas where pasture may be used to better advantage than in the highly cultivated Corn Belt. Also, pasture or clean ground may be best for farmers who plan to continue farrowings once or twice a year. But all signs indicate that this type of hog production is outmoded; the producer of the future will be the specialist who rushes his hogs

through from farrowing to market in assembly-line fashion. This will not work on pasture.

Management requirements such as health, sanitation, manure disposal, water run-off, control of flies and offensive odors, and control of cannibalism are more difficult to cope with in a confinement setup. Diseases spread by close contact of hogs necessitate strict sanitation. But a good health program is easier to maintain with hogs on concrete. A more effective worming program can be carried out, and parasites and digestive upsets are more easily controlled.

Manure is Problem

Manure disposal is a problem which is being solved in various ways. Some producers use water under pressure to hose down the concrete floors, washing the manure into a gutter where it runs into a septic tank, later to be pumped out and used as valuable liquid manure. Bailey uses another method. Once a day, he scrapes the manure into dunging alleys on either side of his enclosed building. In the evening he goes through the four-foot dunging alleys with a front loader attachment on his tractor, pushing the manure to one end of the building and dropping it into his spreader. When his land is in crops, he dumps the manure on a strip of ground three rods wide and one-half mile long, and spreads it in the winter. He does not flush the floors at any time.

The average American used 140 quarts of milk in 1958.

Water run-off must be considered in building a concrete floor. In warm climates where sprinkling systems are necessary and bedding is not used, the slope of the floor should be one inch to the foot. In northern areas where bedding is used, a slope of one-half inch to the foot is sufficient for the sleeping area. Outside the bedding area, where feeders and waterers are located and where droppings and urine will be deposited, the slope should be one inch to the foot.

Other factors to consider in building a concrete floor are that it must be rough enough to provide footing, but not so rough that it will hinder cleaning. Another sanitary aid is to place the first board on the low side of the floor up three or four inches, so that manure and urine will not build up.

Flies are more of a problem in any confinement setup than they are with hogs on pasture. The same is true of odors; the odor from an enclosed building such as Bailey's may be offensive in hot weather, no matter how

clean it is. Therefore, care must be taken as to location of such a layout; the farther from a dwelling the better and to the north or northwest rather than the south, if one expects to keep on good terms with the family and neighbors.

Proper ventilation of buildings will help dispel odors and is very important in cooling hogs in the summer and dispelling drafts in winter. A building over 100 ft. long should be partitioned into sections of 40 to 50 ft. for better ventilation. Other environmental controls such as fans (which Bailey uses) and mist sprayers (Collins' method) help hogs gain faster on concrete and are far easier to handle than the cooling systems used in many pasture setups. In winter, hogs will gain faster and produce gains on less feed if they are away from drafts, have clean, dry bedding, and are sheltered during their eating and drinking. A temperature of 40 to 50 degrees is best for hogs.

Housing Costs Vary

Many types of housing are satisfactory for confinement, and such factors as climate, size of program, and special needs of the producer dictate what is used. For his partial confinement system, Collins built a finishing shed with six 20 x 20 ft. apartments with cement to the front. Each section holds 60 to 70 fattening pigs. Total cost of the open-sided building was $7,500 and he can handle 400 hogs at a time.

Iowa State University agricultural engineers figure that if you start from scratch, a total confinement system consisting of farrowing and nursing houses and a finishing barn — such as Bailey's— will cost you about $45,000 or $20 per fattening hog you plan to turn out. Bailey's large finishing shed capable of holding 600 to 700 hogs at a time cost $20,000. The buildings should last 10 years or longer and can be depreciated annually.

About 20 cents of each dollar spent by consumers for farm-produced foods is used to purchase dairy foods.

Cost of less elaborate units should vary from $10 to $14 per hog for materials.

Part of Bailey's expense went for mechanized equipment, which is a desirable feature in any operation where more than 300 hogs are fed. Bailey's automatic equipment includes storage bins at one end of his finishing house which feed protein and grain through pipes into a grinder and mixer, from where the complete mix is augered by electricity from one end of the shed to the other. He can make his

mixtures vary as to protein content, and holes in the auger tract drop feed into the feeders. Bailey can grind and feed a ton of feed in less than an hour. Grinding and mixing equipment is justified in a large operation because supplements can be purchased in large amounts at considerable savings.

Raising hogs on concrete, of course, is no guarantee of success. The hog producer who has failed to produce efficiently on pasture may not be helped by confinement. Pasture has covered up many feeding and management faults which would become glaring errors if permitted on concrete. But most men handling large numbers of hogs agree that there are probably fewer hours required in caring for them in confinement than in the fields.

Silage for Hogs

A pig pen is the last place you would expect to find a gourmet, but tests have proved that market hogs turn up their snouts at some feeds. One of them is grass silage.

Tests at the Canada Agricultural Experimental Farm, Agassiz, British Columbia, proved that grass silage will have to be made more palatable if it is to be fed successfully to market hogs.

When grain intake was restricted to 85 or 70 per cent of full feed, pigs did not eat enough silage to maintain satisfactory growth.

Pigs on a balanced ration, self-fed, would eat only an occasional mouthful of silage. Pigs on about 75 per cent full feed consumed an average of two to three pounds per day, but their daily gain was roughly .6 pounds per day less than pigs on full feed.

Thus despite increased silage consumption, the amount of grain consumed, considered in the light of body weight gain, was nearly the same as pigs self-fed without silage.

Pigs on the restricted grain diet received half their grain in the morning and the other half in the afternoon, with silage at noon. The lowest silage consumer on a 70 per cent grain restriction ate an average of 2.2 pounds per day, while the highest averaged 4.4 lbs.

At slaughtering, pigs on the restricted grain intake ran one per cent lower in dressing percentage but produced leaner carcasses than the pigs on self-feeding.

—*Butter-Fat*

What It Costs To Produce Milk

This is the way milk production costs per 100 pounds add up in Wisconsin . . .

Condensed from
Wisconsin Agriculturist

HOW much does it cost to produce 100 pounds of milk? How much would you have to get for that milk to earn as much for your work as the average take-home pay for industrial workers in the dairy region.

A recent analysis of records by J. R. Schmidt and S. D. Staniforth of the University of Wisconsin gives some answers to these questions.

The economists found the following production costs per 100 pounds of milk sold in 1958. This was for an average Wisconsin herd of 20 cows producing 8,000 pounds of milk per cow. They figured on the basis that all feed was purchased, the dairyman got 4 percent interest on his dairy investment. Here's how the costs to produce a hundred pounds of milk on this size farm came out:

- *A cost of $2.22 per hundred with no charge for labor*
- *$3.49 with labor charged at average hired man's wages ($1.05 per hour without room and board)*
- *$3.89 paying dairy farm labor at average weekly industrial wages (but with a 63.5 hour work week for the dairy farmer)*
- *$4.85 with labor charged at the average hourly Wisconsin industrial wage*
- *$4.20 with $3,000 labor income from the dairy herd*

To obtain these figures, economists used average farm efficiency for the production of grade B milk. Costs might run somewhat higher for producing grade A milk.

Wisconsin dairy producers actually got $3.11 per hundredweight for 3.5 percent milk in 1958. At this price for the 20-cow, 8,000 pound average herd, the dairy producer would be left only 73 cents per hour for his labor.

An average price of $3.11 per hundredweight would have given slightly less than $1,500 labor income to the dairy farm family with a herd of 20 cows producing 8,000 pounds of milk per cow.

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How did the University arrive at these figures? First, all feed, including pasture, was charged at current local market price rather than at cost of production.

Second, only those costs directly caused by the dairy herd and young stock are included. Third, the costs are based on requirements for a herd of this size and production level, rather than on farm account records.

This method of determining the cost permitted a look at the dairy operation apart from the rest of the farm business, which normally includes raising crops and other livestock.

These figures may not necessarily apply to your farm. Since production costs vary widely from farm to farm, only your own records can really provide an answer on your farm.

Here are the things that make a big difference in the cost of producing milk:

Herd size
Milk production per cow
Labor charge
Source and cost of feed and management

Cost to produce 100 pounds of milk is generally less for a large herd than for a small herd, less for high producing cows than low producing cows.

What would have happened in a 20-cow dairy herd if the cows averaged more milk per cow? This would have been one way to increase the efficiency of the herd.

Here is the net cost of producing 100 pounds of milk with cows of different production in order to give $2,000 annual dairy labor income from the dairy enterprise and 4 percent interest on the dairy investment, using last year's costs:

Milk production per cow	Net cost per cwt. milk sold
7,000 lbs.	$3.93
8,000 lbs.	3.54
9,000 lbs.	3.24
10,000 lbs.	2.99
11,000 lbs.	2.79

You can also reduce the cost of producing milk by increasing the size of herd. How would this effect the cost of producing milk? Here are the costs, charging $1 per hour for labor:

Number of cows	Net cost per cwt. milk sold
10	$4.78
15	3.88
20	3.43
25	3.16
30	2.99
35	2.86

These figures applied to dairy farms give a rather gloomy picture. Almost one-half of all dairy farm families in this study earned no return for operator labor and failed to cover all the other costs.

How did these farm families manage to stay in business if

they didn't make money, you may ask? They did it by taking a reduced standard of living. It's the old story of the wife and children working for nothing.

They can also do it by getting very little or no returns on the money invested in equipment, buildings, land and cows.

Less than 10 percent of the dairy farm families studied paid all costs and got $3,000 for operator labor at recent milk prices.

This $3,000 figure is sometimes used to compare what a family must earn to equal the income of the average industrial worker in this area. It takes into account allowance made for the use of the farm house and farm produce used in the home.

Dichlorodiphenyltrichloroethan — Even if we could say it, think of all the time we would waste asking the clerk for it, if we couldn't shorten the word by asking for D.D.T.

Roughly, it means that only 10 percent of the dairy farm families got as much for their labor as the average industrial worker.

How can a dairy farmer increase his income? We're often told that the answer to low farm prices is increased efficiency. And it's certainly a definite advantage to any individual farmer to lower his costs.

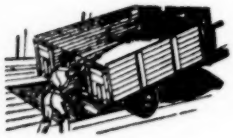
The quickest and easiest way to lower the cost for producing milk is to expand production. That means either more cows or getting more milk from each cow.

But right here is the dilemma which dairy farmers face. Individual producers are faced with the need to increase production in order to improve their income.

But as more and more dairy producers do this, it increases milk surpluses. And in the end it brings a price decline in milk which more than offsets the gains in efficiency dairy producers make by upping their production.

EAT PORK FOR NERVES — Pork is an outstanding source of the B vitamin, thiamine. One serving (3½ oz.) of cooked pork provides 68.7 per cent of the thiamine needed by the average 45-year-old man. Thiamine is the vitamin which helps convert starches and sugar into energy, aids digestion and helps the nerves, muscles and heart to function normally. Nervousness, irritability and poor appetite may result from an inadequate thiamine intake.

Grain Marketing Questions Farmers Ask



Here are the answers farmers want . . .

Condensed from Prairie Farmer

L. F. Stice, University of Illinois

FARMERS want answers to their questions about the marketing of grain. Here is a summary of questions and answers from this year.

. . How can I decide when to market my grain?

The essential information needed to make a sound decision on this question includes price trends, storage costs, and quality factors. The key question is whether the price will rise enough to pay for storage costs.

What is involved in storage costs?

Farm storage costs consist of interest, taxes, insurance on the grain, shrinkage and deterioration, and use of storage facilities. Charges for the use of storage bins and cribs include depreciation, insurance, taxes, interest on investment, and upkeep.

These costs are fixed and, once the crib is built, will exist whether grain is stored or not. So they may not enter into the decision of whether to store or sell in a particular year.

The storage structure may also serve the dual purpose of grain conditioner and storage bin. Corncribs and bin dryers are examples. Slatted corncribs have been profitable largely because they were teamed up with the spring winds to dry corn economically and reduce or eliminate moisture discounts.

Once grain is in condition to market without discount, as in the case of artificially dried corn, the use of the bin is a storage cost and must be offset by price increases if storing is to pay.

Variable costs will be incurred only when the grain is stored and will differ greatly with lots of grain. These items are interest, taxes, insurance on the grain, and shrinkage.

Shrinkage occurs in two ways: through moisture loss and through weight loss incurred in handling rodent and insect damage, and spoilage. Moisture loss is not a cost so long as it is off-

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setting the penalty in moisture discounts or is being offset by a higher price for the dry grain.

How can moisture shrinkage be determined?

Final weight equals initial weight times (100 minus initial moisture) divided by (100 minus final moisture).

Here is an example of how the formula will work: Assume you start with 100 bushels of 20 percent moisture corn and sell it at 15.5 moisture. Substituting in the formula: 100 bushels times (100-20.0 divided by 100-15.5) equals 100 bushels times (80.0 divided by 84.5) equals 100 bushels times 94.6 percent equals 94:6 bushels. Hence the shrinkage due to moisture loss is 5.4 bushels (100.0 bushels - 96.4 bushels).

How much does it actually cost to store grain?

Commercial grain warehouse charges are about 1½ cents per bushel per month including shrinkage, insurance on the grain, and use of the bin. Farm storage charges are likely to range from 10 to 20 cents a bushel for the storage season.

How do these storage charges compare with normal price-increases?

Over the years grain prices must rise enough after harvest to induce someone to store part of the crop through the marketing season. But grain prices may not rise enough every year to pay storage costs.

Harvest-time prices tend to be depressed more by large crops than by small crops. But the quantity of empty commercial storage space in relation to the size of the crops is also a factor. The price of feed grains, particularly corn, is influenced by prices and numbers of livestock, especially hogs.

How much seasonal price increase can I expect from corn?

In the 10 years from 1948 through 1957, according to a recent study of the U. of I. college of agriculture division of prices and statistics, the average seasonal farm price of corn (based on Illinois prices) increased from

An open mind often catches a lot of trash.

93.4 percent of the season's average price in November to 104.2 percent in August.

This is an increase of 11 percent. So when the season's corn price averages $1.10 a bushel, the "normal" low would be $1.02 and the high $1.15 a bushel. This 12 cents increase will more than pay the out-of-pocket cost but will not cover total costs except in the most economical storage facilities.

But statistical averages can be

misleading. Corn storage was profitable in only 5 of the 10 years. Prices following harvest declined in three years and remained about steady in two years.

How much seasonal price increase can I expect in wheat and oats?

From 1948 to 1957, wheat prices in July were about five-tenths percent below their seasonal average price to about five percent above the following March. If the season's average were $1.75 a bushel the normal increase would be 17 cents — from $1.66 to $1.83.

The seasonal increase for the 1958 wheat crop was more — about 25 cents a bushel. This season, with a smaller and more storable crop and plenty of space, the season increase may be less than normal.

Marriage is an excellent cure for love sickness.

Oat prices are over-shadowed by prices for other feed grains and decline until fall. The seasonal increase in the 1948-1957 period averaged 13½ percent from October to May. On 60-cent oats this is only eight cents which will not pay storage costs.

Can I make money storing soybeans?

Contrary to popular opinion, it has not always paid to store soybeans. The increase from 1948 through 1957 averaged about 15 percent with the high in May. This is 30 cents a bushel on $2 soybeans. But sharp increases in a few of these years influenced this average greatly.

The price after harvest declined or stayed even in four years and the recovery in 1948 crop prices came very late in the season. In the future, soybean prices are likely to be more stable if we continue to have reasonable carry-over stocks at the end of the marketing year.

As a corn-producer, what kind of storage should I plan for in years ahead?

Cash corn producers face a real dilemma. Field shelling is antiquating ear corncribs. But it is an open question whether market corn should be stored on farms or in commercial grain warehouses. If government stocks were reduced substantially, warehouses would be begging for corn to store.

Empty commercial storage space makes for cheap storage rates and tends to support harvest-time corn prices. On the other hand, field shelling would stimulate harvest sale of corn, which would tend to depress prices and make storage profitable for those who have space.

Do farmers have any protection from loss if they store grain in commercial warehouses?

All warehousemen who store grain for compensation must operate under the terms of state or federal warehouse regulations.

These acts usually require the warehouseman to issue receipts showing grade and quantity to the holder of the receipt grain of this quantity and quality shown on the receipt, and to carry insurance on the grain or inform the owner of the grain that it is not insured. Farmers should not expect free storage from their warehouseman. But they should expect him to issue receipts and carry adequate insurance on stored grains.

Where is the best place to sell my grain?

Convenience, prices, service, and confidence in weights and grades are the usual considerations in selling grain. Prices in an area are usually uniform from one buyer to another.

When differences do occur, they are more likely due to transportation costs than handling margins. Occasionally a local grain-dealer will make a good sale that will enable him to outbid another nearby dealer, but perhaps only for a short time.

Why have transportation-rate differences been fairly great in recent months?

Railroads have been reducing their rates in order to compete with trucks and waterways. These rate reductions benefit farmers, but they are also causing a great deal of confusion, because the reductions do not apply to all outlets. Also, they often put a tight squeeze on elevator handling margins.

How important are grain grades?

Grain grades and grading procedures are a well organized function of grain marketing. The U. S. Department of Agriculture sets grain standards, licenses official grain inspectors, and gives general supervision to determining official grades.

Country grain dealers sell all rail-shipped grain and some trucked grain on official grades.

A jaywalker is a feller whose feet are just killing him.

They should be familiar with grading procedure. In buying from farmers they determine only the grade factors they know will affect the price of the grain. The usual factors are moisture, foreign material, and test weight.

At times, quality factors that are not part of the official grading standards affect grain value. High-temperature dried corn, rodent-contaminated grains, and mercury-treated grains are ex-

amples.

Who sets price discounts on grain?

Price discounts are set by the grain trade and are not subject to government regulation except on grain that is taken over and sold by the Commodity Credit Corporation. Discounts may change from time to time, depending on the price of grain and other market conditions.

Can farmers do anything to reduce discounts?

Farmers working with their grain dealers can reduce or eliminate most discounts if it is profitable to do so. Examples are garlic in wheat, foreign material in soybeans, mixed wheat, overheated corn, and moisture in grains. Not all of the total moisture discount that is assessed is a penalty because of the weight shrinkage as the grain dries out. However grain that is too wet to store safely is usually penalized.

Farmers who keep themselves posted on grades and discounts are likely to produce and market a high-quality product. Grain dealers are usually willing to explain grading and discounts.

Is there any advantage to forward selling of grain?

Farmers make forward sales of grain when they think a crop is assured and the price at harvest will be lower. Scarcity of old-crop grain will at times support new-crop prices that are higher than seem justified. Under this plan a farmer is wise to sell only part of what he expects his new crop to be. Also, he should expect to fulfill his commitment and not expect a cash advance.

What is deferred pricing?

This is a questionable hold-over practice. Under deferred pricing the farmer delivers his grain at harvest, pays no storage, and settles the price at some later date.

The farmer who follows this practice should understand that he has relinquished title to the grain and is a creditor of the buyer along with all other creditors. He does not know where the grain is, who owns it, or whether it is insured.

Can farmers use the futures to advantage?

Farmers may at times profitably use the futures market to sell or buy grains. They may use the futures to fix the price ahead of the sale of the cash grain, to earn a storage income without the risk of a price decline, and to fix feed prices.

The conditions under which each of these procedures can be successfully followed and the risks involved should be well understood. Otherwise the trade is likely to be an unfortunate speculative venture.

Selection Of Welding Equipment

Are you thinking of buying a new farm welder? Read this article first . . .

Condensed from
Suffolk County Farm News

A farmer who is contemplating the purchase of welding equipment should consider carefully the various factors which are involved in its selection.

The welding equipment needs on any farm may be as different as farms are different from one another. Major factors which should be considered are: (1) Kind of work to be done; (2) Initial cost of the equipment; and (3) Various kinds of welding equipment which may be considered for farm use. Minor factors may be: (1) Operating costs; (2) Maintenance costs; and (3) Personal preference.

Various kinds or types of electric arc welders are suitable for farm use. The most popular kind at present is probably the a-c transformer machine. A limited-input type of 180 welding ampere capacity is usually adequate for most farm electric arc welding. This machine should have a secondary open circuit voltage of 65 to 80 volts. Modern farmers have need for some types of electrodes which will not hold an arc well with the lower open circuit voltages.

If the electric power supplier does not object, built-in power factor correction in the welder is no longer necessary for most modern farm use because these farms are served by 5 KVA or larger transformers. Although an industrial type a-c transformer welder may be permitted for use on the farm by the power supplier, it is doubtful if its use can be justified. A limited-input machine with a 20 per cent duty cycle is very satisfactory.

An a-c/d-c transformer type electric arc welder offers the advantages of both alternating and direct current. Its initial cost is, however. approximately twice that of a limited-input a-c machine. Direct current is better than alternating current for vertical and overhead welding, welding thin iron or steel, using

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more-difficult-to-run electrodes, and pipe welding.

Generator type electric arc welders have the advantage of being portable. An a-c unit may also be used for auxiliary electric power. The initial cost of these welders is as much as four times that of a limited-input transformer machine.

Choice to Make

If a farmer has no welder, his first decision will be to determine whether he should buy an electric arc or an oxyacetylene welder. Generally, the former has the advantage for: (1) Welding iron or steel which is ⅛" or more thick; (2) Doing heavy jobs quickly; and (3) Doing heavy hard-facing jobs. The oxyacetylene welder is generally considered best for: (1) Fast, good quality cutting of iron or steel; (2) Braze welding iron sheet metal; (3) Hard facing thin-edged tillage tools; (4) Welding non-ferrous metals; and (5) Heating iron or steel for bending or heat treatment. Cast iron can be welded equally as well with either the electric arc or the oxyacetylene welder.

Most major manufacturers of oxyacetylene equipment offer three torch sizes, namely, large, medium and small. The medium size torch is usually most satisfactory for farm use. Tip mixers may be designed to match each tip size or they may be of enough capacity to be used with several tip sizes. The individual tip and mixer combination is considered to be the best kind of investment even though their initial cost is slightly higher.

A single stage oxyacetylene regulator, while it does not give as precise a control of gas pressure in the lines, is very satisfactory for farm use. So called economy-size regulators are often a poor investment when not manufactured by a reliable concern.

The line of least resistance is the one you were fishing with.

The demurrage charges on oxyacetylene tanks may be a reason why a farmer will not purchase an oxyacetylene welder. Many distributors, however, are offering tanks on a yearly lease basis, eliminating the monthly accounting of demurrage charges.

Two eggs in the daily diet will supply the following percentages of needed food elements: vitamin A, 22; thiamine or B-1, 16; vitamin D, 24; protein, 17; iron, 22; phosphorous, 13; calcium, 5; and for good measure the old hen adds some vitamin B-12.

Modern Concepts In Swine Feeding

Research has ushered in a new era . . .

Condensed from Feed Age

Dr. J. E. Oldfield,
Oregon State College

THE feeding of swine has perhaps gone through more profound changes than that of any other class of domestic animals.

From the old concept of the hog as a "mortgage lifter" or a scavenger that would make a profit from waste materials no other animals would eat, it has progressed to an up-to-the-minute industry involving carefully compounded ration mixtures. The tempo of the whole swine business has been stepped up, and where a seven or eight month growing period was once accepted, one longer than five to six months is now considered impractical. Along with the emphasis on speed of growth, however, there has been a conscious effort at improvement along two other lines — economy of production and quality of product.

Research in swine nutrition has ushered in the modern concept of swine feeding. Such research has been developed along many lines of approach of which the following are representative:

1. Improvement of utilization of ration ingredients: a. by feed additives, b. by processing methods.

2. Economizing in feeding of the pregnant sow.

3. Restriction of fat deposition in the carcass by diet manipulation.

Improved Utilization of Ingredients

Practically all studies in swine nutrition could fall under this heading, but special attention is merited by developments in the antibiotics field. These materials, now widely used in all branches of animal feeding, have enjoyed some of their greatest success when used in swine rations. Early studies showed that various antibiotics could stimulate faster gains in young, growing pigs when fed at low levels (10-30 g./T) in the diet. These gains were most marked when the animals were exposed to some form of stress condition and were especially noticeable in the

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case of "runt" pigs. A number of experiments investigated the effectiveness of various anti-bacterial preparations.

Significantly improved gains were obtained on Antibiotic A, a "broad spectrum" antibiotic. The insignificant response to Antibiotic B may be due in part to the low level used and to the instability of the form in which it was used during storage in the ration mix. The lack of response to the arsonic compound in these trials, when positive responses have been reported in Midwest experiments, points up the need for duplication of feed trials under conditions where different major dietary ingredients are used.

The most recent antibiotic trials involve use of mixtures of antibacterial substances in attempts to achieve superior results from association of these materials than any one would produce singly. Results of a 107-day feeding trial at Michigan State University showed that pigs fed a ration supplemented with four pounds of such a supplement per ton averaged 1.61 pounds daily gain as compared with 1.47 pounds for supplemented controls. Tests at other stations have also been encouraging regarding the possibilities of these antibiotic mixtures.

Further interest in antibiotics has been stimulated by observations that presence of certain other materials in the diet may enhance their activity, particularly when the diets are high in calcium or magnesium. Terephthalic acid is one compound which is apparently active in antibiotic potentiation, according to one set of studies. Investigations of this phase of antibiotic activity are continuing.

Pelleting

During the last year or two attention has focused on improvement of utilization of swine rations through processing methods. Particularly interesting are the effects noted for pelleted feeds over the same feed mixtures fed in a loose form. At Michigan State University increases of 0.15, 0.18 and 0.36 pounds average daily gain for animals receiving pellets over those receiving meal were recorded on rations of high corn content, 20 per cent oats and 40 per cent oats respectively. These results suggest that pelleting may be more useful where fibrous grains, that pigs may have some difficulty in handling, predominate.

An Oregon experiment, currently in progress, using a ration composed largely of barley, showed average daily gains of 1.68 on pellets versus 1.40 pounds on the same ration fed loose. An interesting sidelight on this latter trial was that the pellets used were soft and crumbly and broke

down considerably during handling. The advantage due to pelleting under such conditions, where the physical nature of the feeds was not markedly different, is most interesting and suggests that chemical changes may also possibly be initiated in the pelleting process.

Heat and Moisture

Such findings, both with pigs and with poultry have sparked a great deal of interest in the effects of moisture and heat upon barley rations with regard to the rate of gain of the animals fed. While it has been demonstrated by Washington State workers that chick growth can be improved on barley rations by soaking and then drying the grain, experiences at the Oregon Station do not show the same results with swine. In a recently-completed trial, growing pigs were fed a ration composed predominantly of barley either soaked or unsoaked. Addition of high amylase-activity barley malt was superimposed on these treatments.

In this experiment the barley was soaked in the whole grain and it may be that the husk of the kernel prevented greater response. In the poultry experiments previously mentioned the barley was soaked in the ground state. More will doubtless be accomplished in this interesting field of enzyme additions to swine diets.

Feeding the Pregnant Sow

The need for economy measures in feeding swine, where they can be introduced without interference with the overall efficiency of the operation, is obvious. Attention has centered on experimentation with the diets of the brood sow for two reasons. First, the requirements of the brood-sow, particularly during the first two thirds of gestation, are not overly critical. Second, the trend toward early weaning of young pigs relieves the sow of much of the nutritional burden of long lactation.

The tendency has been to introduce lower cost, bulky, yet nutritious materials into the diet of the pregnant sow, and two such ingredients are silage of various types and ground sun-cured alfalfa. Good quality silage is quite palatable to sows, which will eat up to 12 pounds per head daily. In areas where swine operations are small, silage feeding to sows is best done in conjunction with the feeding of other livestock. In this way sufficient quantity is consumed to keep silage fresh.

Three experiments have been reported from Purdue University where 30 sows were fed on corn silage and a supplement in comparison with similar sows fed

routinely on a mixed grain diet. The silage fed sows averaged 11.3 pigs farrowed and 8.5 weaned against 10.7 farrowed and 7.7 weaned for the grain-fed sows. Cost per pig at birth was lower for the silage-fed sows. Illinois tests with grass-legume silage also reported satisfactory farrowing performance and decreased cost of production of young pigs, but noted palatability problem if the silage were not good quality.

Most city people dream of becoming farmers at 5 P.M.—never at 5 A.M.

Alfalfa meal or ground sun-cured alfalfa is a material that lends itself well to mixing in dry rations and considerable use has been made of it in economy mixes for brood sows. It has long been recognized that around 15 to 18 per cent ground sun-cured alfalfa in pregnant sow rations has been helpful in the production of large litters of strong pigs. More recently considerably higher levels have been used, mainly in the interests of economy. Montana workers showed that rations containing up to 50 per cent sun-cured alfalfa meal could be fed sows without adversely affecting farrowing performance. However, they did record a tendency toward weight losses in sows on the high alfalfa diets. Minnesota experiments showed that 45 per cent of ground alfalfa hay in self-fed rations for gilts allowed satisfactory gains of 1.2 to 1.3 pounds daily and had no detrimental effect on reproductive performance.

Practical experience in the state of Oregon shows that a number of swine producers are now satisfactorily using levels of 35 to 50 per cent of ground alfalfa hay in their brood-sow diets. It is axiomatic that the quality of the alfalfa be good when it is used at such high levels and that adequate supplementation with animal protein, vitamin B^{12} and other factors that might be deficient, be followed. For years overfatness of breeding stock has been decried by swine producers. Provision of bulky or fibrous feeds in brood-sow rations may be a practical answer to this problem.

Restricting Fat Through Diet

There is an increasing consciousness of the need for a high standard of quality in the carcasses marketed in the swine industry. Popular demand and interest has stimulated selection of a "meat type" of market hog which will yield more lean meat and less lard than earlier favored types. More recently it has been realized that considerable prog-

ress towards development of meatier carcasses can be made by appropriate adjustments of the ration fed at different stages of growth. It is obviously desirable to feed well during the early growth stages, from weaning to 125 pounds body weight, when lean muscle tissue makes up a large part of the daily gains, and less generously later, when fat deposit is the primary growth component.

Restriction of available energy in the finished hog's diet can be accomplished by either (a) hand-feeding, or (b) self-feeding on a diet containing considerable fibrous material. The first alternative is not generally accepted in today's highly competitive and mechanized agriculture, but the latter has been practiced with some success. Workers at the University of Wisconsin showed clearly that backfat thicknesses were significantly correlated with dietary TDN level and that when the TDN was "diluted" by addition of a fibrous feed such as ground alfalfa hay to the ration, leaner carcasses resulted. Unfortunately, such leanness was only achieved as a result of decreased live weight gains, meaning that the feeding period had to be lengthened in order to attain the customary market weight.

Since protein has been commonly agreed to be primarily concerned with synthesis of lean muscle meat by the animal, it has been an interesting question whether elevated protein levels in the diet might support production of swine carcasses containing more lean and less fat. A comprehensive experiment was conducted at the University of Minnesota over the years 1954-56, using both purebred and crossbred hogs. On the one hand, rations were started at an 18.0 per cent crude protein level and dropped to 15 per cent when the pigs averaged 125 pounds body weight; on the other they were started at 14 per cent and dropped to 11 per cent. In all cases backfat thickness was less for the pigs on the higher protein rations than for those on the lower. In two of the three trials reported the lean tissue content of the carcass was higher on elevated protein level.

A dairy expert, who claims to have studied the matter, states that a happy contented cow smiles by cocking her ears forward and brightening her eyes.

Butter-Fat

Experiments at the Oregon Station meanwhile have shown that the energy content of the diet for finishing pigs can be increased by the addition of five

per cent animal fat without detriment to carcass quality when the rations contained 15 per cent or more of crude protein. The dual goals of lean carcasses with undiminished rates of gain seem not to be unattainable and may be reached through use of carefully compounded rations. The latter is particularly true with respect to quantity of protein.

Examples cited herein are but a few of the many ways in which nutrition research may benefit swine production. The pig's outstanding ability in the conversion of crude feed ingredients to high quality meat make it an ideal subject for such studies. Opportunities for continued improvement in swine production through better feeding are indeed challenging.

Silage Can Help Beef Men Reduce Feed Costs

Proper use of silage can help beef cattle producers and feeders reduce their costs and handle more cattle, says J. W. Burch, extension livestock specialist at the University of Missouri.

Burch quotes results of a 1958 Ohio feeding test to back up his point. In the test, two lots of yearling steers were fed 220 days. One lot was fed corn silage plus five pounds of corn daily and the other was on a full feed of corn.

The lot of yearlings on silage gained 2.39 pounds each day at a cost of $14.33 a hundredweight and sold for $26.74 per 100 pounds. Cattle full fed corn gained 2.42 pounds daily, had a feed cost of $17.66 per hundredweight, and sold for $27.55.

It cost $3.33 less to produce 100 pounds of beef on the silage-fed cattle but they sold for 81 cents a hundredweight less than the corn-fed yearlings, Burch says. The net saving by maximum use of silage was $2.52 a hundredweight.

This saving could be a mighty important item for cattle feeders in the years just ahead, he says.

In the Ohio test, feed prices were $1.40 a bushel for corn; $70 a ton for soybean oil meal; $10 a ton for silage; and $25 a ton for alfalfa. Both lots of cattle were fed stilbestrol.

Research workers in the University of Missouri's animal husbandry department have had equally good results in the use of silage for wintering young cattle and cows.

Burch says feeders who hope to stay in the cattle business can in general, ill afford to be without silage.

—University of Missouri

Should You Specialize Or Not Specialize

Do you face this question?

Condensed from Nebraska Farmer

Dean Brown,

Nebraska College of Agriculture

BASIC to most agricultural management decisions is the farmer's consideration of his own individual situation.

Usually he must choose between two conflicting conditions or goals: (1) the level of risk he is willing to assume, and (2) the level of profits he would like to attain.

In the investment of capital, the investment which appears to offer the highest returns often (and usually) also involves the largest risk. This too applies to the farm. An investment or enterprise with possibilities of high returns involves risks corresponding to nature, while the enterprise with little risk will usually give low returns. Since very few farmers are completely free from risk aversions, the problem facing most operators is "How to best combine possible profits and possible security."

For farmers who consider security and stability as more important, *diversification* generally is considered as the means to greater income stability with less risk. It has been interpreted as being a method whereby farmers with limited capital and a high risk aversion can secure a more stable income.

Looking at the other side of the coin, *specialization* generally allows for the same total resources employed over a period of years. Yet, from year to year, specialization will involve greater risk and income instability.

Throughout most of the cornbelt, a limited amount of crop and livestock combination and diversification is necessary to make the fullest use of resources and to obtain maximum production. This is normally true on any farm where supplementary or complementary conditions between livestock enterprises exist. Beyond this point, however, specialization holds the g r e a t e s t promise for those farmers concerned with increasing their farm incomes or maximizing profits.

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Through specialization, management skills, capital investments and labor can best be utilized. Livestock buildings and equipment can be designed and constructed for a specific use, resulting in more efficient utilization. Maximum use can be made of machinery. Management and labor can be devoted full-time to a single enterprise, thereby making it possible to achieve a higher level of labor and management skills. As a result production losses and costs are more easily controlled and a greater total volume of production can be achieved.

Specialization vs. Diversification

Let's take a look at specific conditions in the cropping situation. Generally speaking, corn has been higher in value per acre than any other grain crop that a farmer can raise. Because the growing season and moisture conditions for corn and soybeans are essentially the same, yield variations are quite similar. The same is true for grain sorghum.

When tillage begins, other arts follow. The farmers, therefore, are the founders of civilization.

—Daniel Webster

Except in cases of more extreme drouth conditions, yield variations will follow virtually the same pattern as corn. As a result, income variation is reduced very little, income stability is increased only slightly, and average income is lower when a combination of these crops are grown.

With corn and hay combinations, the results are different. Much of the land in the cornbelt will produce more corn by including legumes and hay in the rotation. As long as hay in the rotation increases the total production of corn or complements corn production, the total income can be increased by including hay. Beyond this point of complementarity — where more land in legumes decreases total corn production — increasing the hay acreage may decrease income variability, but average income also decreases.

The figures shown in Table 1 indicate that using 50% hay on a farm may reduce variability of income (year to year fluctuations) by about 14%; but at the same time average income over a period will be reduced by 23%.

As a result, unless the added forage in the rotation is needed for the livestock program, any gain in income stability or reduction in year to year variation of income is offset by a greater loss in average income. Thus a fairly heavy price in average crop in-

come must be paid to reduce the variation of income from year to year.

Controlling Costs

Most people recognize that costs per unit of production are usually reduced as volume of production is increased. This is not only true for the entire farm, considering all production together, but it is also true for individual enterprises. This is true because many of the fixed costs do not increase as rapidly as production. A tractor and corn implements may be used to produce 50 acres of corn. Corn acreage may be doubled or tripled with only a small increase in the total cost of owning such equipment. As a result, the cost of production per acre may be reduced appreciably as corn acreage is increased.

As another example, cultural practices such as fertilizing and chemical control of insects may increase yields per acre quite markedly. The increase in production usually is sufficiently greater than the increase in costs that the cost per bushel is reduced. The farmer with seriously limited capital (in areas where fertilizer is recommended) can usually make more profit by putting his capital into fertilizer rather than considering a livestock program. In other words, specializing in crop production and intensifying production practices when capital is seriously limited will usually pay higher profits.

In livestock production, parallel examples can be shown. Labor requirements per dairy cow may be reduced as much as 25% by doubling the size of herd from 10 to 20 cows; and another 12-15% by increasing the herd to 30 cows; labor requirements for feeder cattle going from 40 to 80 head, may drop as much as 35% and more than 50% by increasing to over 120 head. The labor required per litter of pigs may exceed 40 hours with 10 or less sows. By increasing to 20 litters, labor needs may drop below

TABLE 1

Average Crop Income and Year to Year Variation of Income, Comparing Corn and Hay in Western Iowa.*

	Average Crop Income	% Variability
100% corn	$1,140	95%
50% corn-50% hay	887	81%
Percent change	down 23%	down 14%

* Taken from a study made at Iowa State University.

TABLE 2.

Annual Labor requirements per unit for various kinds of livestock.

Hours labor required for kind of animal (per animal)		Hours labor required per animal when number of livestock is:	
		Doubled	Tripled
10 dairy cows	110-140 hours	85-100 hours	70-80 hours
40 feeder cattle	12	8-9	6-7
10 sows	35-40	25-30	20-25
200 laying hens	3¼	2-2¼	1½
40 beef cows	25	15-20	10-12
100 feeder lambs	4	3½	3

30 hours per sow, and increasing to 40 litters or more the labor requirements may very well be less than 20 hours per sow. (See table 2.)

Capital requirements per animal for buildings and equipment also may be reduced as the number of animals increases. Housing costs per animal may drop as much as 20-25% as the size of the enterprise is doubled. By the same token, equipment costs can be reduced. A tractor and unloading wagon may be needed for feeding 60 steers, but this same equipment could be used to feed 150 or 200 head of cattle.

Although labor and capital investment economies can be realized through the expansion of livestock enterprises, the advantages are not as great as one may think. This is true mainly because these items represent a relatively small proportion of the total costs in livestock. Since feed alone represents about 75% of the costs for hogs, beef, and lambs and about 65% of the dairy and poultry costs, the lower labor and capital investment costs for large units give only slight reductions in total costs.

In addition, most all economies of scale are gained as soon as small sized enterprises are passed and volume begins to approach that which will keep one or two men fully occupied. In other words, a two-man dairy farm has little or no economic advantage over the one-man dairy farm.

The greatest chance for increasing profits though specialization comes from the opportunity of developing the overall management of the enterprise. A farm operator can become a specialist, devoting most or all of his time to the varied problems of raising hogs, feeding cattle or

dairying. It is through the added proficiency he gains in controlling disease, feeding, breeding and marketing that he can increase profits.

Making Full Use of Resources

In many of the family farm operations of the mid-west a limited amount of diversification may be necessary to maximize income. Although dairying may be his major livestock enterprise, a dairy farmer may find it profitable to raise some hogs and keep a laying flock. By so doing he may make better use of some of his buildings, more fully employ his family labor and more fully utilize other resources at his disposal.

A farmer specializing in hog production may find it profitable to feed some cattle, so as to utilize forages unsuitable for hogs and to make use of cattle buildings and equipment. As a general rule, a farm operator can increase his farm income by a combination of two or more livestock enterprises if it results in fuller and more efficient use of the resources at his disposal.

On the other hand, the desire to use certain resources to the fullest degree may penalize farm income or the desire for maximizing income on the farm. As an example, beginning operators usually have little control over the kind and number of buildings found on their farms. In most cases, the buildings are already on the farm at the time they take it over. As a natural result, the operator may tend to fit his livestock program to the building situation.

If there is a chicken house, a central hog house, and facilities for dairying, he has chickens, hogs, and dairy cows. He feels that he must make use of all his buildings. In most cases, this may be a logical decision to make. In many others, the operator may be better off financially to convert such buildings for other uses or let them stand idle and concentrate livestock production in one or two enterprises. His other resources — labor, capital, management ability, and feed — may return him much higher profits by specializing.

Reducing Risk in Production

In the past, production techniques and limitations on capital or credit have been factors limiting the degree to which farmers specialized in crop and livestock production. In addition, the aversion to risk and wide variation of income have prompted farmers to diversify their production.

As in the case of crops, two or more kinds of livestock can be produced together to lower risk. One way is to combine a fairly certain enterprise with a risky

one. If the risky enterprise suffers a big loss, there is still the steady one to fall back on. Some farmers will take a chance at "beating the market" by feeding cattle or lambs, while using the dairy cows or hogs as the foundation for their livestock farming.

The United States has 6 per cent of the world's total land area.

The combination of livestock enterprise to reduce risk generally is based on the premise that they will not all fail at the same time. It is not common for low prices, due to the cyclical production patterns in livestock to hit various kinds of livestock at the same time. Thus, combining two or more livestock enterprises will reduce the variation in income from year to year. However, since such combinations of livestock do not usually result in the best or most efficient use of resources, average income is lowered.

With present day technology of livestock production, farmers may do well to consider another method of reducing risk: by producing livestock for market several times a year. Hogs farrowed for market several times a year mean somewhat less price risk than pigs farrowed only in the spring. Although spreading of labor may be the final basis for decision (since farmers usually plan hog farrowing to miss periods of peak labor requirements for crops), multiple farrowing will make more efficient use of buildings and equipment. Many large cattle feeders today are following the same principle in their operation. Cattle of various weights are bought several times of the year. By varying the feeding program with their cattle, they can market cattle every month (or week) of the year.

In general, farmers of the corn-belt area must accept some sacrifice in income to obtain greater stability of income. Including a dairy or beef cow enterprise in the farm plan on farms with less than 150 crop acres may reduce risk with little sacrifice in income.

Because of labor restrictions on dairying and low capital returns on beef cows either enterprise may be a questionable method for spreading risk on farms with more than 240 crop acres. The sacrifice of income will be fairly great for the average operator.

If you still want to consider ways of holding down risk and income stability other safety precautions may be followed:

(1) Select a relatively safe enterprise — raising hogs as compared to feeder cattle or feeder sheep involves less risk.

(2) Stagger production to not only make better use of buildings and equipment, but to avoid "putting all your eggs in one basket."

(3) Keep a high equity or a high cash reserve in your farm business. Then if prices break or something else goes wrong, you're in a position to get out easily.

(4) Adopt flexible plans and enterprises. Plan and construct buildings which can be used for more than one kind of livestock with little or no cost of conversion. Be able to shift your feeding program and length of feeding period for any livestock enterprise. Don't think you have to carry this year's cattle to high choice grades because you made good money last year doing so.

More Changes Forecast for Farming

The old distinctions between farm and city are rapidly disappearing, said Reagan Brown, extension rural sociologist at Texas A & M College. Rural nonfarm people now outnumber farm people by a ratio of 5 to 3 and it appears certain that more nonfarm people will live in rural areas.

More than a third of farm operators work off their farms 100 days or more per year. In 1957, about 40 per cent of net income of farm families was from nonfarm sources, he said.

Family operated farms will increase in size since technological improvements are by no means complete. Agriculture, said Brown, appears to be only in the middle of revolutionary changes both in size and capital structure. Larger farms mean larger investments, not only for land and buildings but for all the machinery and nonagricultural supplies needed in modern farm production. Based on present trends, investment per commercial farm by 1975 may amount to over $80,000 in 1958 dollars compared to a little less than $40,000 now, he said.

Commercial family farms will probably continue to be the dominant form of organization in American agriculture. Labor requirements have not increased with the size of farms except in some limited areas. For the bulk of farmers, efficient operation seems likely to require no greater labor force than has been needed in the past, he added. *—Texas A & M College*

Land Forming

It can be done in many ways but even a little pays a lot . . .

Condensed from Arkansas Farmer

A farmer's proud claim that his is "the most level field for miles around" can easily mean that his land needs to be formed for better water control. There may be low places that don't show up until rain causes ponding.

Land forming is a redistribution of soil, to establish gentle grades to provide good field drainage, facilitate irrigation and prevent erosion. Grades on a land formed field are smoothed so that water will not collect and drown crops. When properly done, this method results in fields that are equally well drained throughout their area, or equal amounts of irrigation water can reach every part.

Land forming that eliminates wet, detour spots and point rows and transforms small, odd-shaped fields into larger, regularly-shaped ones will save money for farmers when it comes to producing crops.

Farmers who buy bigger tractors in an attempt to increase operating efficiency often find reshaping the land necessary to get maximum efficiency out of the machines. By planning ahead, land owners sometimes realize that the forming practice is a prerequisite to larger, more productive equipment.

Water standing in a field hours after a rain is often an indication that improvement of the land is needed. Much of the terrain that needs land forming doesn't appear to require it when the field is dry. Only after a rain do indentations appear — full of crop-stunting (or drowning) water.

Visibly rough fields shouldn't be a first choice for land forming. Other water control measures probably will be more effective. It is often the "most level field for miles around" that needs attention most.

Land forming solves problems and increases profit at the same time. It is defined simply as moving soil from high spots to low spots to aid removal of excess water and evenly distribute desired water. The end result of

Reprinted by permission from Arkansas Farmer, Box 246, Little Rock, Arkansas

this job is a field which has a slight, continuous, even slope.

In different parts of the country this practice may be called land leveling, land smoothing, land grading or field forming. "Land leveling" usually means flattening land, while "land forming" (by whatever name the practice is called) is done to a grade; often .2-foot elevation to every 100 feet of horizontal distance.

The procedure for this method is the same as for any earthmoving job — establish the need, engineer the job, and move the dirt.

Some farmers may want their long-range drainage and irrigation plans in a master soil conservation plan. If such is the case, earthmoving will include building ponds, terraces, grass waterways, and other necessary conservation structures.

First step in a project is a detailed survey of the land with elevations taken every 100 feet (50 feet in problem areas) to form a field-wide grid. Elevations should be taken on relatively firm soil, since freshly tilled earth often doesn't give realistic elevations. Soil Conservation Service offices can be of great assistance in these surveys.

Field grid elevations are plotted onto a contour map. Elevations are usually shown at .2-foot intervals on the map. From it, calculations of earth-moving requirements can be made, and grade stakes can be placed on the ground to show depth of cuts and fills when work begins. As work progresses, the contour map will serve as a check during inspections of the job.

First step in the actual land forming job is to subsoil areas which will receive fill material. These low areas, which probably have ponded water in the past, may have a hardpan. Filling the area will not necessarily increase the possibility of water saturation if the hardpan is allowed to remain.

Before starting the earthmoving, it is important that the soil be dry enough to prevent excessive compaction. Although heavy earthmoving equipment is best so that fill areas can be compacted, too wet soil can be compressed into an impervious hardpan. It also is desirable to have a low percentage of undecayed organic matter in the soil, because green vegetation interferes with the action of the field planer later in the job.

Thousands of palm trees are being planted in Uruguay to protect level fertile soil from wind erosion.

If it has been determined from the contour map that the job is primarily short-haul (up to 300 feet) it is advisable to use a bulldozer-equipped crawler tractor for the earthmoving.

If dirt must be moved 300 to 1000 feet to accomplish the major land forming task, it is usually advisable to resort to crawler-drawn scrapers. Scrapers also may be used for cutting waterways and ditches in an overall soil and water conservation plan.

If dirt must be hauled 1000 feet or more, a high-speed, rubber-tired tractor-scraper is the most economical (cost per yard/-per hour) unit.

After rough grading (cutting high spots and filling low spots) is complete, the field may be disked. This prepares the soil for the work of a field planer which is used to bring the area to finish grade. Finish grading with the planer is best accomplished by three passes across the field. The second pass is 90 degrees to the first, and the third at 45 degrees to the first.

If the land is to be irrigated, the third and final pass should be in the direction of irrigation water flow.

Final grade on a land formed field will vary with the type of soil. The best slope is one which allows excess water to run off slowly enough not to wash topsoil, yet fast enough that the water does not harm the crop.

Last step of the operation is deep chiseling, sub-soiling or other deep tillage practices to relieve any compaction or hardpan complications in the soil.

On the average, land forming involves moving about 350 cubic yards of dirt per acre. Survey and contour mapping of a field costs an average of one to two dollars per acre. Detailed engineering work (including staking the field for cuts and fills) average three to five dollars per acre.

Cost of moving dirt in the field is subject to the variables of types of equipment, amount of soil being moved, haul distances, time allowed, and whether the job is done by the land owner or a contractor. Fifty to 75 per cent of the average 350 yards of dirt per acre is usually bulldozer work. Averaged figures show that cost ranges from $40 to $100 per acre for the earthmoving phases of the overall forming operation.

The bee and the silkworm are the only insects that have been domesticated by man.

Experience has shown that most land forming jobs pay for themselves within three years. Fifty per cent of the work pays for itself the first year. Ninety

per cent is paid for in two years. A sample case is:

Eight acres of a 40-acre field are subject to annual flood and crop drowning. The remaining 32 acres produces 80 bushels of corn per acre, markets at $1.25 per bushel. Those flooded eight acres caused an annual loss of income of $800 (8A x 80 bu. x $1.25). Land forming in this average field cost $55 per acre, or a total of $2200. Bringing the 40-acre field to 40 acres of productive capacity by land forming boosts annual income the $800 formerly lost and repays the forming costs within three years. (This sample case does not take into account possible increased yield from the other 32 acres by breaking up possible hard-pan by chiseling during the land forming operation.)

Land forming is not a panacea for all irregular field problems. Parallel terracing or other land treatment practices may be better for rough slopes or hillsides. However, land forming always should be considered when an owner investigates field or farm improvement.

Milk secretion in a cow's udder is a continuous process.

Local agricultural experts from governmental agencies are familiar with the various practices and are willing to advise land owners of the practices best suited for the particular situation.

"Land forming is the most valuable thing a farmer can do to improve his farm."

That's the way H. R. Gilbrech of Palmer, Monroe County, Arkansas, sums up his experience with land forming. Gilbrech is in a good position to know, too. He's precision-leveled about 50 acres and has formed another 500 acres of his 1300-acre farm.

"Results have been far beyond my expectations," he said. "I find that land forming gives me five big benefits:

"1. I get my crop in on time. One 20-acre patch that used to be the one I had to plant late in the season is now the first one planted.

"2. I can get the crop out on schedule, even if late rains come.

"3. I get a full crop. One leveled field once gave me about 75 per cent of a full yield. Now I harvest the whole thing.

"4. I get more efficient machine use, save labor and save time. It's no longer necessary to dodge pot-holes or go around little hills. All operations go much faster and smoother.

"5. It's much easier to save a crop with irrigation when the fields are leveled. I have five pumps scattered around the farm and they can take care of the whole works."

Gilbrech, now in his third year of forming, worked over a 20-acre patch as his first project. It was a boggy field with many low spots. At best he couldn't plant anything in it before June. Now that it has been leveled to grade, it's ready for planting earlier than any of his fields.

He uses a 2½-yard earth mover for the major overhaul, then follows up with a land leveler to bring his fields to one-tenth of a foot per hundred feet. The result is elimination of wet spots in low places and dry spots in high places.

Soil Conservation Service engineers provide invaluable assistance on projects involving precision leveling. They draw topography maps, then determine just how much earth should be moved and where it should be put. Working from these SCS drawings, Gilbrech places marked stakes at 100-foot intervals. The machine operator uses these stakes as a guide to his operation.

Gilbrech also uses the services of his Production Credit Association at Brinkley, Arkansas, to get the job done. Most of his operating capital is supplied each year by PCA and it's repaid when crops are sold. In addition, Gilbrech borrowed enough PCA money to buy his scraper and plane, using the intermediate-term plan (five-year credit) to pay it back.

Brinkley PCA Secretary Harold Henry described another way in which Gilbrech makes good use of PCA funds. When a new land forming project is started, Gilbrech borrows enough money to pay for the expense of getting it done. Then when his ACP cost-sharing payment is received, he repays the loan.

"It amounts to an advance on my government cost-sharing," he said, "to lighten the need for tied-up capital."

Another way Gilbrech keeps his land forming expenses down involves his method of timing and equipment use. He has just two pieces of equipment designed especially for land forming. All power is supplied by tractors already on hand. Throughout the season he uses idle time to work on land forming. This helps him get maximum efficiency out of his machines and his hired men.

"I think I'll add a smaller eath mover to take care of quickie patchwork and to make ditches," he said. "Perhaps a 1½-yard would work well for both purposes."

Gilbrech said he'll eventually have the farm's 700 tillable acres leveled to grade. Meanwhile, he'll continue sculpturing his topography to improve the farm's productive capacity and efficiency.

FUN ON THE FARM

A Collection of Jokes and Humorous Farm Stories

The old country doctor parked his car, a Model T Ford, in front of the drug store and went in to buy a few supplies.

When he came back out a large crowd of small boys was standing around his old car and laughing loudly at it. The doctor climbed into the seat and said in a mild tone of voice:

"The car's paid for, boys." Then he looked deliberately from one boy to another. "You're not, you're not . . . you're not."

—Texas Farming and Citriculture

★ ★ ★

An American millionaire bought an old estate in Scotland and, to preserve the historic flavor of the place, he preserved its old name — Seldoon — and had it embroidered on all his new table linen.

Then a neighbor told him the real origin of the name, "Seldoon." A spaghetti manufacturer who had owned the place from 1953 to 1955 had dreamed it up; it was "Noodles" spelled backward.

—The Balance Sheet

A cannibal chief had trouble with a choice meal cooking on his broiler and asked a witch doctor for advice. "Does he have a round white collar and a black frock?" asked the witch doctor.

"No," said the chief. "He's got a shaved head with a circle of hair, a long brown cassock and sandals."

"Oh, no wonder," said the witch doctor. "He's not a broiler, he's a friar."

—Wall Street Journal

★ ★ ★

The way some people treasure a dollar bill one would think it is worth the paper it's printed on.

—Wisconsin Agriculturist

★ ★ ★

Two retired spinsters who decided to buy a poultry farm went to a dealer and explained their situation. They said they wanted to buy 200 hens and 200 roosters. The poultry dealer smiled a little and said, "Two hundred hens is O. K., but you really won't need 200 roosters."

"We realize that," one of them said, "but we know what it is to be lonely."

—The Lion

The secret of success lies in making hay with the grass that grows under other people's feet.

★ ★ ★

Farmer Robinson greatly treasured a certain choice Jersey heifer. So, when accosted at a feed store by a stranger, he maintained a wary attitude.

"How much is that heifer of yours worth?" the stranger asked.

Farmer Robinson scratched his head in doubt.

"Are you a tax assessor or has the heifer been killed by an automobile?" he demanded.

—*Edward L. Van Dyke,* American Agriculturist

★ ★ ★

The medical unit of the University of Tennessee offered this prescription for ulcer sufferers: "Take one shaded creek bank, a fishing pole, and forget the bait."

—*Mrs. Stella Riley,* The Progressive Farmer

★ ★ ★

A sheep rancher suddenly struck it rich. His first purchase was a Cadillac limousine. On his next trip into town, the dealer meeting him on the street inquired how he liked the car.

"Say fella," said the sheepman, "that there is a real nice automobile. Sure do like that winder back of the front seat."

"How's that?" said the salesman. "You don't have a chauffeur!"

"Don't need no chauffeur, sonny," said the sheepman, "but that winder keeps the sheep from licking my neck when I'm taking 'em to market."

—*Dugout News*

★ ★ ★

Social tact is the art of making your guests feel at home, particularly when you really wish they were.

—*Farm Store Merchandising*

★ ★ ★

A small Pennsylvania boy — who later became a very, very successful businessman — once asked a neighbor farmer the price of a fine, big melon.

"That's 40 cents," said the farmer.

"I have only four cents," the boy told him.

"Well," smiled the farmer, and winked at his hired hand as he pointed to a very small and very green melon, "how about that one?"

"Fine, I'll take it," the boy said, "but don't cut it off the vine yet. I'll call for it in a week or so."

—*Butter-Fat*

★ ★ ★

Civilization is a system under which a man (or woman) must pay a quarter to park his car so he won't be fined a dollar while spending a dime for a nickel cup of coffee.

—*Crops and Soils*

"I'm worried," the young farmer told a neighbor, "because I keep talking aloud to myself and asking questions: 'Can I pay my income tax?' 'Will I have any income to be taxed?' 'Should I sell the crop now?' and so on."

"Don't worry," the neighbor assured him, "that's normal. Just let me know if you start giving yourself the answers."

—Canadian Ayrshire Review

★ ★ ★

"The sausages you sent me have meat at one end and bread crumbs at the other," stormed the lady customer.

"Yes, madam," replied the butcher, "in these tough times it's pretty hard to make both ends meat."

—The Lion

★ ★ ★

The old mountaineer was sitting in his favorite cane-backed rocker on the front porch of the cabin, slowly rocking east and west. Nearby sat his forty-year-old son, rocking north and south.

"Son", drawled the old man, "it's about time you learned not to wear yourself out that way. Rock the way the board runs, and save your strength."

—Suffolk County Farm News

★ ★ ★

Once when he returned from a European trip Mark Twain became somewhat miffed at a customs official who was poking through his trunk.

"Must you make such a mess of things?" asked the author. "I told you I have only my clothes in there."

Suddenly the official straightened up, a bottle of scotch whiskey in his hand.

"You call this 'clothes'?" he said.

"Of course," replied Twain. "That's my nightcap."

—Holstein-Friesian World

★ ★ ★

A successful businessman, after eight years of absence, alighted at the station of the old home town. Despite his expectations, there was no one he knew on the platform.

Discouraged, the man sought out the station master, a friend since boyhood. He was about to extend a hearty greeting when the station master exclaimed: "Hello, George; going away?"

—Implement & Tractor

★ ★ ★

A smart-alec tourist tried to show up the backwoods storekeeper by asking, "Can you change this $18 bill?"

The storekeeper surveyed the contents of his cash register and replied evenly, "Yeah — you want 3 sixes or 2 nines?"

—The Furrow

★ ★ ★

When you know the answer no one asks you the right question.

—Ruritan

Grandmother was giving the recent bride a heart-to-heart talk.

"Child, I hope your lot's going to be easier than mine. All my married life I've carried two burdens — Pa and the fire. Every time I turn to look at one the other goes out."

—Arkansas Valley Journal

★ ★ ★

It is rumored that a new simplified income tax form for next year contains just four lines:

1) What was you income last year?
2) What were your expenses?
3) How much have you left?
4) Send it in.

—Grange Monthly

Opportunity knocks on the door but once. Trouble is more persistent.

—American Farm Youth

★ ★ ★

People who borrow money to get themselves out of the rut usually end up in the hole.

★ ★ ★

When the hen-pecked husband died and went to hell, he immediately started bossing the imps around and giving orders.

"Say," roared Satan, "you act as though you owned this place."

"I do," said the newcomer, "my wife gave it to me while I was on earth."

—Shopping Guide

Cheaper By The Two-Dozen

Consumers buy more eggs when they are sold in two-dozen egg cartons than in one-dozen packages.

Research at Michigan State University with supermarkets in the Lansing, Mich. area, showed that when eggs were packaged in two-dozen cartons at one to one-half cents cheaper per dozen, more eggs were sold than when single dozen cartons were used, even when the price advantage stayed the same. *—University of Delaware*

Beaks Not Needed — Debeaked chicks convert feed into body weight better. Broilers debeaked at three weeks of age did better than chicks debeaked at one day of age.

Want a cow-sitter? — For dairy farmers who would like an occasional break from tending cows, a Michigan extension dairy specialist proposes "professional cow-sitters" to take over the milking chore.

Conservation Farming Pays Off

Good management and soil knowledge are vital . . .

Condensed from
New Jersey Farm and Garden

Robert M. Hanna

ROBERT MANNERS, Wertsville, New Jersey, dairyman, says farming with a sound soil conservation program has increased the yields of his crops and improved his 145-acre farm.

He is so sure of this that he has had similar conservation practices applied to his uncle's farm — some 211 acres — which he rents.

On the two farms, some 3,500 feet of tile drains have been installed, with 261 acres of contour strips. In addition, there are about 13,700 feet of diversion terraces on the two-farm operation, a farm pond on Manners' and some 500 feet of wildlife hedges and small feed patches.

To point out how his land has produced crops under conservation farming, Manners has hanging in his home three certificates for being a 100-bushel-corn-club winner and two certificates for being a winner in the green pastures contest.

In order to get high production from his cows, Manners says he has to strive for top quality and high yields on all his crops. In order to do this, he points out, you have to hold the soil in place, get rid of excess water, keep all you can on land where water is needed and keep the soil in a productive state.

Conservation farming is no more than good planning, applying and management of various practices on a farm, as Manners sees it. For 17 years, he's been farming. In addition to producing top quality and high yields, his aim has been to maintain and improve his farm land's productivity.

When Manners started farming, soil conservation districts were just beginning to be formed, but he could see the value of them and signed up as a cooperator. Through his district supervisors he asked for technical assistance in getting conservation practices planned and staked out on his farm. Trained personnel

Reprinted by permission from New Jersey Farm and Garden, Sea Isle City, New Jersey

of the Soil Conservation Service spent a great deal of time making a farm plan and lining up various conservation practices for his farm.

Manners says he took a lot of kidding about the contour strips and diversion terraces from his neighbors the first few years. Through this period, he and his wife, Elsie, used to talk about whether they were doing the right thing. But deep down in their hearts, they were sure this was the type of farming which would give them the greatest yield at the lowest cost, and at the same time protect their farm from erosion and build up its productivity. Now some of those same neighbors have their entire farms under a similar program!

Having a farm in such good condition, as a result of his conservation practices, is one of the reasons Manners is still farming today, for he was burned out about a year ago! He lost some 12,000 bales of hay, two silos full of silage, two barns and sundry equipment — at a loss of some $60,000! With a setback such as this, to stay in farming you have to have assurance productive land is available before you start to build up again.

Manners carries some 65 head of milkers on his dairy farm, raises his own replacements and generally fattens out a few steers on his uncle's farm. This year, he's putting up about 400 tons of silage in a bunker silo, about 274 tons in upright silos on his own farm and 101 tons of his uncle's farm. In addition, he usually cuts 12,000 to 15,000 bales of hay a year.

His land is usually planted to about 130 acres of alfalfa and clover, 60 of corn, 34 of wheat, 27 of barley, 20 of rye and Sudan grass, 10 of soybeans and sorghum, and 75 of improved pastures.

Keep a phenothiazine-salt mixture before sheep at all times.

Summing things up, Manners says, "Anyway you look at it, soil conservation is imperative. If we are too shortsighted to follow a sound land-use program, we substantially decrease our own profits. We cannot neglect to apply a soil conservation program to our farms.

"I'm looking to the future of my two children — Guy, 6, and Debbie, 10. I hope when they grow up, this farm will be better than the day I started farming it.

"I would say that along with all the conservation practices go good management and an understanding of the soils on your farm. Studying the map of your

farm furnished by the soil conservation district and keeping records of soil tests, fertilizer applications and yields will make the conservation practices on your farm much more efficient," points out this dairyman.

As a final point in behalf of a sound conservation program: Studies have been made which show that an investment of $25 to $60 an acre in conservation practices may easily result in as much as an extra $1,000 profit each year from a 100-acre farm operation!

USDA Scientist Designs "Automatic Pilot" for Steering Tractor

An "automatic pilot" that steers a tractor while cultivating corn has been developed by a U.S.D.A. engineer at the University of Minnesota. It takes the hard work out of one of the toughest steering jobs farmers normally have with tractors.

With this device, the driver simply starts the tractor on the right row. Then the "pilot" takes over until the tractor reaches the far end of the field. The driver still turns the tractor around at the end of the row and into the next one. But while actually cultivating, all he need do is ride along.

USDA engineer Louis A. Liljedahl designed the device for use with hydraulic power steering, already a feature on many tractors. Here's how it works: A set of "feelers," which hang from an electric switch unit on the front of the tractor, straddle the corn row. If the tractor moves slightly to the left, for example, the feelers move the opposite way. This movement closes an electric switch in the pilot mechanism, which in turn opens hydraulic valves in the power steering unit and the tractor is guided back into the proper direction.

At 4 miles per hour (normal speed for cultivating) the tractor will go only 2 or 3 feet after moving away from the row until it is back on course. The automatic pilot does not affect the tractor's normal steering mechanism; the operator still has full control. Purpose of the device is to make for more accurate cultivating, with less injury to the corn and less fatigue for the operator. It could also make it possible to cultivate at higher speeds.

Future research will be on extremely small plants, like corn or soybeans 2-3 inches high. This is the stage at which cultivating is most difficult and when automatic steering would be most helpful.

—University of Minnesota

Beating The Clock With Electromechanization

Electricity helps save more pigs per litter . . .

Condensed from
Rural Lines

J. P. Schaenzer

MANY farmers do not yet realize how much time machines can save them.

A dairyman milks at the rate of a cow a minute—and occasionally beats that time. Another, with a herd of 100 dairy cows, gets ready, milks, and cleans up in a little more than 2 hours. A broiler raiser, utilizing the best equipment he can buy, figures he can care for 60,000 to 80,000 chicks—without hiring any outside help. A cattle feeder buys an unloader for a vertical silo and finds that he saves, not hours, but a whole month of 50-hour work-weeks a year.

A factory that learned how to triple production per worker within a few years would consider that achievement something of a miracle. Yet that is what has happened on the U.S. dairy farm—and it has happened *since* the introduction of machine milking.

When machine milking first came into use, one man was able to milk 20 cows an hour, using two milking units. Later, the U. S. Department of Agriculture pointed out that dairymen using only two stalls were leaving their milking units idle for three minutes between cows. When a third stall was added to get cows ready for milking, the idle time dropped to less than one minute. Before long, some individual dairymen were milking 30 cows an hour.

Recently, dairymen have managed to milk from 50 to 60 cows per hour by using a "herringbone" type of milking parlor, with as many as 16 cows in the parlor at one time. To operate it, a dairyman simply pulls one rope to open the parlor for eight cows, then pulls one rope after another to feed them. A pull on another rope closes a gate behind them.

Reprinted by permission from Rural Lines, Rural Electrification Administration, U.S.D.A., Washington 25, D. C.

Next, he washes udders, strips milk from each teat into a cup and puts on the electric milkers. When the first eight cows are milked, he turns to the cows on the other side of the parlor.

As the milk is produced, it is collected by vacuum in a small container. From there, it is pumped to a bulk milk tank for cooling, with the quantity shown in pounds on a dial for recording. A plastic bottle can be attached for securing a butterfat sample. On some models, a flashing red light warns the operator that the milk flow is nearly finished or that a teat cup has dropped off.

Another timesaver is the clean-in-place sanitary pipe, which conveys the milk from the cow to the milk cooler. A special solution is pumped through the pipe to cleanse it, and the vacuum pump produces a scrubbing effect as the alternating surges of solution and air pass through the pipe. As a result, no dirt or dust can enter the pipeline; the milk is cleaner and has a lower bacteria count.

Electromechanization is not limited to the mechanics of milk collection. With a pressure water system, for instance, water can be piped to drinking cups or bowls so that cows can drink at any time. Iowa State College has found that cows with drinking water always available drink 18 per cent more water than cows watered twice daily. They also produce 3.5 per cent more milk and 10.7 per cent more butterfat.

Water is kept free of ice at all times with stocktank water heaters or floating de-icers. Usually, the water temperature is thermostatically held between 35 and 40 degrees.

One of the toughest jobs on a dairy farm is handling materials like hay, silage, bedding, concentrates, and manure. According to the University of Massachusetts, the quantity of material handled annually for a 40-cow herd comes to 760 tons, or 19 tons per cow.

Electric motors and conveyors can relieve the dairyman of much of this labor. Silage can be automatically removed from a vertical silo and dropped directly onto a mechanical bunk feeder. Time saved with the unloader alone has been estimated at 200 hours a year. And several types of gutter cleaners have been developed, virtually eliminating one of the most arduous and disagreeable tasks in dairy farming. Michigan State University reports that it takes only 80 kilowatt-hours to remove and load 212 tons of manure a year from a typical 35-cow barn.

Finally, many milk houses in the North are electrically heated during winter months to prevent

freezing of milk and water lines. The job can be done with resistance heaters and blowers, with electrically heated water, or by using the compressor of the milk cooler as a heat pump.

As a result of these innovations, says one prominent dairy specialist, a man can milk, feed, and care for 100 cows during an 8-hour day. A hired hand on one Idaho dairy farm is in sole charge of 120 milk cows, and he works about 10 hours a day. In a year's time, he puts in about 30 hours per cow, compared with the national average of 125 hours.

Electromechanization is causing some dramatic changes in the poultry business, too. In the up-to-date laying house, birds are housed on litter, with a population as high as one bird for every square foot of floor area.

Perches, waterers, and feeders are installed, one above the other, over a droppings pit. Several times a week, a barn cleaner removes the droppings. Forced ventilation and solar heat make for a dry house, even in damp, cold months.

Such a poultry house is also equipped with electric lights, which help provide 14 hours of illumination during the short fall and winter days. A time clock, wired into the circuit, controls the lighting period. Tests by USDA show that from December through May, hens in lighted houses produced an average of 13.6 more eggs each than those in unlighted houses.

Use extreme caution and follow manufacturer's instructions when using pesticides.

As in the dairy business, a continuous supply of water has proved essential to high production. Researchers at Oregon State College found that pullets drank 25 per cent more water during freezing weather when it was continuously available to them. Egg production increased by as much as 20 per cent. And apart from the higher output, poultrymen who water by hand report that this chore consumes about one-third of the time they spend caring for chickens. Water supplied automatically under pressure does away with this chore forever.

More research will be needed to develop electrically operated devices to take over egg gathering, cleaning, grading, and casing. This sort of work now takes three-fourths of a poultryman's labor, even in a highly mechanized poultry house. A few of the larger poultry farms already have endless egg gathering belts, which bring the eggs from the hens to the cooling room for cleaning, candling, grading, and storage.

Automatic cleaners and graders have been developed which are economical for flocks of 500 hens or more. But the big breakthrough is still in the future. When the problem is solved, one man will be able to care for from 20,000 to 25,000 hens.

Wheat grows in every one of our 48 states, occupies more farm acres than any other single crop (some 80 million acres) and is harvested somewhere in the world every month of the year.

In the livestock business, electricity is being harnessed to control the environment of animals. Beyond any question, the air that the animals breathe, the humidity, the hours of sunshine, and the temperature have a direct bearing on their health and weight gains. Electricity can be used to make sure each of these factors is favorable to maximum production.

For example, the University of California has found that hogs averaging 100 pounds in weight gained the next 100 pounds on less feed at temperatures between 70 and 72 degrees than at any other. At 200 pounds, they utilized feed most efficiently at 60 degrees. USDA's H. L. Garver points out that the feed savings at these controlled temperatures, when compared to the conditions found in many hog houses, would soon pay for good housing of pigs.

Garver also reports an experiment in California's Imperial Valley, in which a fan was used to blow air over a herd of beef cattle when the temperature was 100 degrees or higher. The cattle in the fanned area gained 2.3 pounds per day, versus 1.3 pounds for a similar herd without a fan.

The Oklahoma Agricultural Experiment Station has run a different type of experiment on 34 pregnant sows. During the summer of 1956, water sprinklers were placed over one-half of the animals. Sprinkling continued until all the animals were moved to the farrowing house in late August.

Results were impressive. The 17 sows that were sprinkled during pregnancy farrowed an average of 2.35 more live pigs per litter. They weaned an average of 2.05 more. And when litters were 56 days old, pigs from sprinkled litters weighed 85 pounds more than pigs from unsprinkled ones.

Heat lamps have been used on both baby pigs and lambs for a number of years, but their use will undoubtedly become more widespread in the future. Some 3 million pigs still are lost each

year in the United States because of crushing or chilling. About 75 per cent of these deaths occur before the pigs are 3 days old.

Wisconsin hog authorities state that one pig of every three farrowed in the Corn Belt is lost before weaning age. They estimate that by using a brooder for 10 days, one pig more per litter may be raised. Purdue University kept records on 105 sows which farrowed 8.5 pigs per litter. With electric brooding they saved 1.5 more pigs per litter than without. And the University of California conducted three-year trials with electric pig brooders and found that they could reduce pig losses by one-half.

Not only are more pigs raised per litter for market with an electric pig brooder, but they can be farrowed in colder weather and earlier in the season. Being ready for market in the early fall, they usually command a higher price.

Less is known about the benefits derived from lamb brooders, but a number of raisers report that brooding newborn lambs from one to five days is proving profitable. Under the brooder, they are dry within one-half hour after birth.

All these applications of electricity to farm chores not only are lightening the farmer's burdens, but they also are helping him to produce more food with less labor.

The really successful person is the one who can bounce back from adversity. We recommend a study of the following record to anyone who thinks the world has turned against him, just because he has failed in one or several things. You know the name of the man to whom the following refers. As you read it, try to figure out who he is.

"Failed in business in 1831. Defeated for Legislature in 1832. Failed in business again in 1833. Elected to Legislature in 1834. Sweetheart died in 1835. Suffered nervous breakdown in 1836. Defeated for Speaker in 1838. Defeated for Elector in 1840. Defeated for Congress in 1843. Elected to Congress in 1846. Defeated for Congress in 1848. Defeated for Senate in 1855. Defeated for Vice-President in 1856. Defeated for Senate in 1858. Elected President of the United States in 1860."

The above refers to Abraham Lincoln.

—*The Nebraska Farmer*

Crossbreeding Cattle For Profit

The advantages of crossbreeding are numerous . . .

Condensed from Breeder's Gazette

C. C. O'Mary
State College of Washington

IN an effort to get bigger, stronger and faster-gaining calves, many commercial cattlemen are using a crossbreeding program.

Crossbreeding is mating a purebred bull of one breed to purebred or grade females of another breed. Since this can be a continuing breeding program, breeding of purebred bulls with crossbred cows is also considered crossbreeding.

Some cattlemen prefer a rotational crossbreeding program using three breeds. The manner in which this program is used is to cross two breeds (A and B) then on the crossbred cows to use a bull of a third breed (C). The next bull used would be one from one of the first breeds (for example breed A). Following that a bull from breed (B) is used. Such a breeding program is designed to keep heterozygosity at a maximum by using a bull from a breed that is least related to the crossbred cows.

Crossbreeding does bring about heterozygosity and is just the opposite of the effects of inbreeding where homozygosity is increased. A bull of one breed may have the genetic makeup of AA, bb, CC, etc., while the females of the other breed may be aa, BB, CC, etc. When the matings are made, then the offspring has a greater degree of heterozygosity as they are Aa, Bb, CC, etc. The parents were homozygous in their pairs of genes, whereas the offspring is heterozygous in the Aa, Bb, pairs of genes. The beneficial effects come from the fact that the favorable genes tend to be dominant and cover up the effects of the unfavorable genes.

The advantages claimed for crossbred cattle are greater strength and vigor at birth, more rapid gains prior to weaning, heavier weaning weight and greater gains in the feedlot. In experimental work with Angus, Hereford and Shorthorn crosses the crossbreds appear to be superior to the purebreds, although in some cases these differences

Reprinted by permission from Breeder's Gazette, Columbia, Missouri

were small. In some cases the gestation period of crossbred calves was shorter and the birth weight less than the purebreds. One report gave a 4.5 per cent increase in calf crop of crossbreds over purebreds. Reports on weaning weights have given an advantage of 10 to 100 lbs. or more to crossbreds over purebreds. Differences in feed lot gains have varied from practically no increase to more than one-quarter of a pound per head per day. In one study when crossbreds were compared with purebred Herefords the returns above feed and market cost of crossbreds over Herefords varied from $3.39 up to $21.33 per steer. No information on purebred Angus or Shorthorns was available with which to compare the crossbreds in this study.

The increased milk production of crossbred dams would be expected to influence the weaning weight of their calves if hybrid vigor is expressed in this trait. Milk production of the dam is considered the major factor affecting the weaning weight of her calf.

Considerable crossbreeding is done in the South using the Brahman on various British breeds (Angus, Hereford, Shorthorn). The Santa Gertrudis breed was developed as a result of crossing the Brahman and Shorthorn. More recently the Brangus was developed from the Brahman and Angus cross. Other crosses using the Brahman have also been made.

The genetic makeup of the Brahman would be expected to differ considerably from the British breeds as it belongs to a different species —*Bos indicus.* (The British breeds are the *Bos taurus* species.) With this wider cross using the Brahman we would expect even greater heterozygosity in the crossbred animals. In Angus-Brahman crosses the hybrid vigor has shown up in both growth rate of the calves and mothering ability of dams. Some of the other reasons for using the Brahman cross are to obtain heat tolerance and more resistance to insect pests. The crossbred cattle do have the advantage of being able to continue to gain better where the temperatures are high and the pastures have no shade.

The optimist says: 'The glass is half full'. The pessimist says: 'The glass is half empty'.

Use of crossbred sires is not recommended. Occasionally an outstanding crossbred bull may be produced and the breeder be tempted to use him. The offspring from such a bull is likely to lack uniformity. Since the bull

does carry the recessive genes (hidden), they may combine with other recessives in crossbred females and undesirable traits may appear.

Crossbreeding has its disadvantages which should be recognized before using this type of breeding system. One cannot expect to maintain a herd of purebred cows strictly for the production of first-cross offspring. The reproductive rate is too low to produce sufficient purebred replacements and at the same time a high per cent of crossbreds for market. Purchase of purebred replacements is considered too expensive. This then leaves the alternative of using dams that are crossbred in various degrees since after a few years they may have ½, ¼, 5/8 or some other fraction of the original breed. These cows do not produce calves of a uniform color pattern and some buyers of feeder cattle may discount them.

Discounting crossbred feeder cattle came about primarily because of the purchasers' fear that they had some dairy breeding and would later develop poorer conformation during the feeding period. To avoid this discount and get full advantage of the weight gains the producer should make sure that the buyer knows the cattle on the home ranch. Many purchasers of feeder cattle do return to the same ranch year after year for feeder cattle if the feeders perform well in the feed lot. The other alternative is for the producer to feed out his own cattle.

A good foundation herd of cows and the consistent use of top quality herd sires are prerequisites to success in a crossbreeding program. Selection and culling must be used with this program as with other breeding systems.

Livestock Surgery Eased

The first successful gas machine for safely anesthetizing horses, cattle and other large animals for surgery has made its debut. Large animals can be anesthetized without being tied up and without dangerous struggling — even in the recovery period — by a combination of pre-operative injections and use of the new anesthesia machine. The machine is the first U. S. closed-circuit anesthesia gas unit that will safely keep large animals asleep for operations of any length of time. It can also be used as a resuscitator.

—*Louisiana Farm News*

Chimney Smoke

by Irene Rudie

October, October, A dancing gypsy girl,
Whose scarf is pinned, To a rainbow wind
And blown across the world.

— Marion Doyle

I heard a hunter wish that farmers would soak up some of their field corn with tranquilizers during the pheasant season. Something like that might help deer hunters get their limit too.

★ ★ ★

I like to see little old ladies wearing red dresses; they remind me of maple trees in the fall.

★ ★ ★

Like a piece of crocheted lace, the fabric of marriage can be ripped apart by pulling on one thread, if that thread happens to be selfishness or self-pity.

★ ★ ★

"He who loves you much will make you cry," is an old Spanish proverb. That, according to Sam Levenson, is the role of loving parents to say "no" to some of the wants of their children, for their own good.

★ ★ ★

Now that the crops have been gathered in it's time to get someone to do the chores for a few days, and drive off for a vacation with the family.

Consider the case of the hapless farmer whose clothing was ripped from him by a cornpicker while in the field on a cold and windy day. He couldn't go home for his wife was entertaining Ladies' Aid that afternoon, nor even go through the yard to the barn. He waited in the shelter of some bushes until the school bus brought the children home, and with them, help.

★ ★ ★

After complicated directions for making apple jelly, a very old cook book says, "Pour into gallipots and cover with oiled paper." Gallipots, says Webster, are apothecary jars, popular on kitchen shelves again.

★ ★ ★

Pick your puppy carefully, says a book on advice on the care of dogs, but sometimes we have no choice, it's a stray puppy that picks us.

★ ★ ★

Drives in cars or in baseball mean nothing unless one reaches home safely.

When Animals Shrink — So Do Profits

It pays to keep shrinkage low . . .

Condensed from Wallaces Farmer

Dick Hagen

FARM to market hog shrinkage, costly to pork producers, can be reduced.

According to Purdue University animal scientists, hogs lose from less than one-half of one percent to 4 percent of their weight between feedlot and market scales.

They figure an average 3 percent shrinkage catches the majority of cornbelt swine marketings.

What is this costing you? An average 3 percent shrink represents about $1 loss on each 200 pound hog at $15 prices. Trimming this shrinkage by one percentage point means an extra $1 on each three hogs you market.

Time, rather than distance, is the determining factor of shrinkage. It's the total time hogs are exposed to a strange environment and away from feed and water that causes shrinkage.

Also, the most rapid rate of shrinkage occurs early in the haul.

"The first 20 miles are your heavy shrinkage miles," says Bill Zmolek, Iowa State University livestock specialist.

Hot weather marketings make shrinkage even more of a liability. When temperatures reach 90 degrees and up, hogs are easily and seriously distressed. It's a fact that marketing death losses jump as the mercury rises.

This is because hogs don't sweat. They can perspire only thru their snout. Hogs also carry a greater amount of fat than most other animals.

On the other hand, cold weather has little effect on shrink, unless accompanied by other adverse weather conditions.

Temperatures between 20 and 60 degrees are the most favorable for hauling hogs, say the Purdue folks. They advise making provisions for cooling if shipping in hot weather.

How can you reduce shrink?

USDA reports trucks equipped

Reprinted by permission from Wallaces Farmer, 1912 Grand Avenue, Des Moines 5, Iowa

with sprinkling systems can cut hot-weather transit shrinkage. Meat yields after slaughter are greater, too, from the sprinkled animals.

Here's what USDA found: Shrinkage of sprinkled hogs was 2.2 percent as against 3.3 percent for the unsprinkled hogs. And there was a 0.47 percent greater meat yield from the sprinkled animals. Hogs were sprinkled immediately after loading and 4 times enroute on the 300 mile trip to market.

Trucks can be easily equipped with a sprinkler system. Plastic "lawn-soaker" garden hose fitted to the underside of the top deck will do the job.

A Story county, Iowa, farmer literally bathes his hogs prior to shipping in hot weather.

Bob Sandquist runs 3 to 4 inches of water into a concrete holding pen. Hogs are thoroughly soaked and cooled by loading time.

Next choice, if truck isn't sprinkler equipped, is having it bedded down with wet sand.

"And if you're hauling any distance, be sure the truck is covered to keep out the sun. Ventilation slots are helpful too," adds Zmolek.

Loading at 25 percent below or 15 percent above capacity can increase shrink by 15 percent. Hogs should also be loaded easily and carefully to minimize excitment.

'Confining hogs in the evening and loading early the next morning helps keep them from overheating," thinks Richard Alleman, Polk county, Iowa, hog producer. Most farmers agree that this practice fits well with summer loading.

In brief, to keep shrinkage low . . .

- Keep physical activity of hogs to a minimum during marketing. Excitement and crowding increase shrink.
- Plan your loading with care. Holding animals in strange pens and trucks causes unnecessary shrink.
- Don't overload or underload.
- Keep a record of your experience. The more you know about shrinkage, the better you'll market your stock in the future.

Dragon's Beard Tree

The scenic shrine island of Miyashima, just 20 miles from Hiroshima, boasts one of the world's most unusual pine trees. Known as "the Dragon's Beard," it's only 2 feet high but stretches 85 feet along the ground. —*Farm Bureau Spokesman*

Bull Care And Management

Once you have found the right bull, protect your investment with sensible management to insure an active, long life . . .

Condensed from The Shorthorn World

A. L. Neumann, University of Illinois

HOW often have you heard or read statements such as these: "It is with regret that we announce the untimely death of the champion bull Futuristic, especially now that his first crop of calves is on the ground." Or, similarly, "Did you hear that Smith had to ship his good young bull because he was such a slow breeder?"

A study of the ages of bulls which are siring the calves being registered each year would show that only a small percentage of the calves are sired by bulls over five years of age. Bulls still in use at ten years of age and older are extremely rare.

Have you tried to buy a sound, aged bull with progeny in production in order to take advantage of information gained in a production-testing program? Of course the demand for such a bull, if he is outstanding, is tremendous, but the fact is that not many such bulls remain in production. All too often when they are found they are unsound in feet and legs, or they are arthritic, or they are unable to serve a cow naturally.

"Bad luck" in herd bull management usually means poor management and/or neglect. It is hard to understand why men spend so many days and drive thousands of miles attending sales and shows, and invest many dollars to buy the bull they count on to "put them on the map" will turn such a bull, usually fitted, out into the pasture with a herd of cows without further thought or attention. And yet, most breeders who sell purebred bulls have had buyers write or call to tell them that their bull is not settling cows, or that he has gone lame, or any one of many other complaints.

The bull is not only responsible for half of the inheritance of his calves but — and this seems like a trite statement — he must be fertile and active if there is to be a calf crop at all. Furthermore, a

Reprinted by permission from The Shorthorn World, 16 South Locust St., Aurora, Illinois

point often overlooked is the value of getting a calf crop bunched into the shortest possible calving season. This requires a bull that is ready for heavy service from the start if the herd consists of more than a dozen or fifteen cows.

Aside from the primary objective in good bull care and management — namely, the maintenance of an active, fertile state in the bull for a number of years — there is the factor of the bull's appearance. Most prospective buyers feel they are not good judges of bulls in thin condition. Thus, when paying a visit to a herd to look over the prospective herd sires or females for sale, a buyer likes to see the herd bull in fit condition, and that means, to most people, carrying considerable flesh or finish. Possibly the time spent in studying the get of the bull or their performance records would give prospective buyers more information than studying the herd bull himself. But as yet most buyers place tremendous emphasis upon the appearance of the herd sire in making their selections.

It is difficult to know where to start to discuss the points of herd bull care and management. For the sake of a beginning, they will be discussed in the order in which the writer feels these points are most often neglected.

Feeding the Herd Bull

A balanced ration containing adequate amounts of protein, vitamin A or carotene, and the minerals calcium and phosphorus can be easily obtained on most farms and ranches. These are the basically essential nutrients aside from salt and are the cornerstones of a good bull ration. What about an energy source, you may ask. This was deliberately left to the last because the required amount of an energy source, such as corn, barley, or oats, depends upon the age and condition of the bull. Bulk is also desired and, of course, is easily supplied in the form of hay, silage or pasture.

During the non breeding season — usually late fall, winter, and early spring — mature bulls

Grass pastures and meadows respond to 50 to 75 pounds of nitrogen per acre by giving earlier, more nutritious pasture next spring.

in average flesh can satisfactorily be conditioned for the coming season on a full-feed of mixed hay, prairie hay or oat hay. The addition of from one to two pounds of a protein supplement per day is necessary, especially if the hay runs heavy on grass. Up to six or eight pounds of

ground ear corn, rolled barley, sorghum or oats would not be harmful and might pay if attractive appearance is essential. At the same time the additional energy in all probability will not improve the next year's calf crop. Silages may be substituted for the hay but generally not over half of the roughage should be in the form of silage. Straight legume hays are usually avoided because of the tendency to produce bloat and scours in some bulls. Salt and a simple mineral mixture, such as one composed of equal parts of ground limestone, bonemeal, and salt, should be available at all times. If roughages are of poor quality the protein supplement should contain a vitamin A supplement.

A domestic turkey will grow to about 100 pounds weight, if given a chance.

Yearling and two-year-old bulls and very thin bulls can be fed on the same feeds but the grains should be fed at the rate of from three-fourths to one pound per 100 pounds body weight.

During the breeding season a daily feeding of six to eight pounds of a mixture of grain and protein supplement, mixed in the ration of 8:1, is recommended for yearling and aged bulls especially if pasture-mating is practiced.

Pasture-mating is preferred in most situations. However, young and aged bulls will need additional feed as indicated earlier, and not over a dozen cows should be bred by a yearling bull in a six or eight-week breeding season. The number that can be handled by mature and aged bulls varies with individual bulls. Two-year-old and older bulls, except for the really aged bulls, can handle from thirty to sixty cows. However, the breeding dates of a few individual cows should be noted down so that a check can be made on whether or not the cows are being settled.

Hand-mating by bringing the bull to the cow or vice versa naturally extends the use of the bull over more cows. One good service is sufficient. Unfortunately cows have a habit of coming in on weekends, holidays or when rain is threatening the hay crop. In practice, hand-mating probably spreads out the calf crop more than pasture-mating.

Artificial insemination works well when cows are in winter quarters, but for the man who wants spring calves the problem of finding the cows in heat is sufficiently difficult to cause smaller calf crops than when pasture-mating is practiced.

Exercise

Much of the crippling, especially of older bulls, during both the off-season and the breeding season can be explained by a lack of exercise. Given the opportunity, most older bulls will exercise sufficiently if penned with a younger bull or a couple of steers. An outdoor pen with long, narrow dimensions is preferred, and placing the shade, salt, water, or feed bunk at the end opposite the shed will insure daily walks. Even young bulls need exercise, especially during the time immediately preceding the breeding season, in order to harden them for work on the rough ranges which are sometimes prevalent. Bulls coming off the show circuit should be exercised during the letting-down period.

Foot Care

This is a problem which varies from farm to farm and from bull to bull. Some pastures are sufficiently rough so that feet wear off short during the breeding season. Some bulls simply grow more hoof than others. Keeping the feet well trimmed — from underneath only, please — will keep the toes spread apart, thus reducing foot-rot problems and insuring that ankles and hocks are not forced out, especially in young bulls.

There is some question whether trimming the feet of older bulls is worth the risk of injury to the bull in anything except very bad cases. Unless the operator is experienced, older bulls can easily be crippled, and one often hears of some good but old bull being sent to market because of an injury sustained during foot-trimming. Just as with too much energy in the ration, this may be another case of killing a bull with kindness.

Shelter

Most bulls, especially in the Corn Belt, are probably oversheltered. An open shed which turns water, snow, and prevailing wind is adequate. In fact, there is less trouble with pneumonia, parasites, foot rot, and lack of exercise when such a shed is used. A crushed rock or dry dirt floor is preferred to concrete because it will stay dryer and require less bedding. Of course the open shed should open on to a long outside run as mentioned earlier. When more than one shed is required an alley should separate the two runs or an electric wire should be used to make it impossible for bulls to fight through the fence.

The Mint is about the only place that can make money without advertising.

Parasite Control

Although it is doubtful if external parasites actually reduce the size of the calf crop it certainly is important to control lice in winter and flies in summer. Bulls will stay in better shape — and don't forget that the appearance of the bulls is used by buyers as an indicator of good all-around herd care.

In those areas where internal parasites are a problem the damage may be more serious. Rather than give specific recommendations here, it is suggested that breeders consult their local veterinarian, county agent, or similarly qualified person. This, of course applies also to diseases affecting reproduction.

Finally, a discussion of herd bull care could not be complete without mentioning that fertility testing of bulls is becoming an integral part of the year-round program. A semen check usually includes a study of viability and numbers of sperm cells, normalcy of cells, and semen volume. Spotting a slow or non-breeder bull before the breeding season starts will give one time to make other arrangements.

Efficient Poultry Management Pays

Only the more efficient, larger poultry laying flocks pay for management, report Purdue University agricultural economists and poultry scientists.

A recent study shows that flocks of more than 500 layers yielded a return to management after covering all costs, when efficiently managed. Average flocks, on the other hand, yielded no management returns over cost, in spite of favorable egg prices during the study. The staff members analyzed records of 47 poultry farms.

Poultrymen with fewer than 600 birds received under a dollar an hour for their labor, on the average. Larger flocks returned about two dollars per hour labor. The records further revealed that costs of the most efficient flocks were about seven cents per dozen eggs lower than average costs for all flock sizes.

The Purdue scientists point out that this is a considerable difference. Laying flock owners should be greatly concerned with the efficiency of their birds, no matter how large or small the flock.

Purdue University

High Milk Production Insures Rapid Growth

Beef calves do better when their dams are heavy milk producers . . .

Condensed from
Farming In South Africa

Q. P. Campbell,
Agricultural Research Station

IF beef is to be produced economically, attention must be given not only to the quality but also the quantity of the beef produced. Relatively high milk production by beef cows is of particular importance if rapid growth and high weaning weights in calves are to be ensured.

Perhaps even more important is the fact that, after having been weaned, the calves of good milkers apparently continue to grow more rapidly than those of poor milkers. Futher research is, however, necessary to determine to the extent, if any, of the correlation between milk production and beef production.

The following data however, give interesting indications of what may be expected:

At the Vaalhartz Agricultural Research Station, in South Africa, the growth of calves of five different breeds was compared last year, and at the age of 3 months the average weights were (before being weighed the calves were s t a r v e d for 18 hours):

Beef Shorth'n	173 lb.	(10 cal.)
Africander	180 lb.	(15 cal.)
Dairy Shorth'n	189 lb.	(11 cal.)
Red Poll	219 lb.	(11 cal.)
Friesland	225 lb.	(5 cal.)

The calves were allowed to remain on pasture with the cows, which were not milked. Initially, the Friesland as well as the Red Poll cows had to be milked for a time since the calves were unable to strip them of all their milk.

Results

It therefore appears that the calves of a dairy breed make the most rapid growth, followed by those of the so-called dual-purpose breeds, while the calves of the two beef breeds are the slowest growers. This is to be expected, however, since the calves which get the most milk will

Reprinted by permission from Farming In South Africa, Dept. of Agriculture, Pretoria, So. Africa

grow the most rapidly. Actually the Friesland calves should have weighed even more, but, as there were several late-season calves in the group, the average weight of these Friesland calves was somewhat lower.

The following tables show how two different groups of calves of the same breed grow after having been weaned when one group is considerably heavier than the other at weaning age.

TABLE 1

Average weights of early-season Africander calves
Heavy group equals 9 calves; Light group equals 7 calves

Age	Heavy group	Light group	Difference
9 months	501 lb.	447 lb.	54 lb.
27 months	886 lb.	808 lb.	76 lb.
After 112 days in feeding paddocks	1,063 lb.	966 lb.	97 lb.

TABLE 2

Average weights of early-season Red Poll calves
Heavy group equals 10 calves; Light group equals 10 calves

Age	Heavy group	Light group	Difference
9 months	352 lb.	280 lb.	72 lb.
27 months	740 lb.	677 lb.	63 lb.
After 112 days in feeding paddocks	922 lb.	878 lb.	44 lb.

The dams of the Africander calves were not milked at all, but those of the Red Poll calves were milked. In the case of the Red Poll calves of the heavy group, however, the dams were not milked as heavily as those of the light group.

The quantity of milk which a calf receives, therefore very clearly affects its weight at weaning. Furthermore, appears that; provided the calves receive all their dams' milk, the heavier animals increase their lead in weight after weaning; but when the calves are divided into two random groups one of which is given little milk and the other plenty, as in the case of the Red Polls, the lighter calves grow faster than the heavier ones. The result is that the initial difference in weight between the latter two groups is considerably reduced.

It can therefore be accepted

that the calves of good milkers grow more rapidly than those of poor milkers. What is of even greater importance is that the calves of cows with high milk production continue to grow more rapidly after weaning than those of cows with low milk production and that the older the calves of the former group become, the heavier they are in comparison with those whose dams give little milk.

Meat-Milk Correlation

The conversion of feed into milk or meat appears to be correlated, and if the performance of a beef breed is to be satisfactory the cows must also produce an adequate quantity of milk. On the other hand, it is also possible for certain dairy breeds to produce beef quite effectively and economically. At the research station a young Friesland bull, which had been burdizzoed and then marketed as a six-tooth steer, weighed 747 lb. on the hook without being fed any concentrates whatever.

More research is however, necessary to establish with certainty the extent to which milk and meat production are correlated.

The above-mentioned results seem to indicate that it was not merely by chance that the dam of the famous bull Monkey was a cow described as a "red Shorthorn dairy cow with approximately 1/16 Braham blood." His sire was Vinotero, a Braham bull. The remainder of the history of this animal is well known in America and to cattle breeders throughout the world. The Klebergs of the famous King's Ranch in Texas used Monkey to serve many beef cows, and his progeny was particularly outstanding in respect of weight gains and beef conformation. The well-known Santa Gertrudis beef breed was developed from the progeny of Monkey.

The question which now arises is: "How can the commercial beef farmer benefit by this, since it is quite impossible to have all the cows on a large ranch tested for milk production. His first step should be to send to slaughter all cows whose calves have not reached the desired size and weight at weaning age, and also all the progeny of such cows. This is not really as easy as it may seem, since these cows are very often the finest in appearance in the herd.

Cattle should be sprayed for lice control before cold weather and winter housing conditions begin.

Solution

The real solution, however, is that the breeders of stud beef

cattle should make as much use as possible of performance tests to produce *not* better-looking but economically more profitable bulls.

As has already been indicated, the progeny of bulls which grow and put on flesh rapidly, should be good milk producers whose calves will also be rapid growers. This should result in calves which grow more quickly which sets in motion a circle which will lead to economic beef production. Provided this improvement is coupled with sound farming practices and conservation farming, it will have a favorable effect on beef farming in particular and on the agricultural industry in general.

The only question is whether the commercial beef producer can wait until there are sufficient bulls (at reasonable prices) which he be reasonably sure, will produce calves which will make efficient use of their feed. Or will he have to abandon pure beef production as a result of economic pressure caused by the slow turnover of his capital which is one of the biggest problems of beef producers and one which can be greatly aggravated by slow maturing calves.

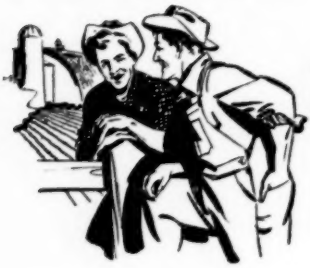
Pelleting Gives Faster Gains, Cost More

Pigs fed pelleted rations gained faster on less feed than those fed rations in meal form, but pelleting expenses resulted in higher feed costs, according to research done at South Dakota State College. Researchers reported that pigs on pellets gained 3.4 per cent faster on 2.9 per cent less feed, but a cost of $6.50 a ton for pelleting made gain from this feed more costly. —*Agricultural Extension Service*

The double-four herringbone milking parlor is the best arrangement for the average one-man dairy operation, says the U. S. Department of Agriculture after extensive tests. This arrangement will take eight cows at a time; they stand about 30 inches higher than the operator's floor position.

It takes only 4 Canada thistle plants per 16 square feet to reduce wheat yields by 30 per cent, Montana researchers find. With 50 shoots per 16 square feet, wheat yields dropped 60 per cent.

Another Look At The Farm Problem



A straight-forward discussion of our farm problems and what we might do to solve them . . .

Condensed from Iowa Farm Science

Earl O. Heady, Iowa State College

OUR farm economy has two major problems: (1) continuing overproduction — a long-run problem and (2) the surplus stocks now on hand — a short-run problem.

The surplus stocks, of course, are an outgrowth of the continuing overproduction. But both will have to be solved — and perhaps attacked in different ways — if resources in agriculture are to earn returns on a par with those in other industries.

The essence of the overproduction problem is that, with the present and prospective productive capacity of its resources, agriculture now has more resources than are needed to produce food for the nation. These resources are continuing to produce more food than the market will absorb at prices giving satisfactory incomes to our farm families.

The standard in measuring these incomes is the return to labor and capital used. Over the last 10 years, the average return to labor and capital in agriculture consistently has been lower than the average return to the same amount of resources used in other industries. And this situation is likely to continue for some time unless some major changes can be made in the structure of American agriculture.

Surplus Production . . .

This long-run problem stems partly from general economic growth. As a nation grows economically — particularly a wealthy nation in which consumers generally have good incomes — the possibilities for agricultural expansion aren't nearly as great as for many nonfarm industries. The reason lies in the way consumers (who are relatively well fed and well off) spend their growing incomes.

Studies show that for each 1-

Reprinted from Iowa Farm Science, Iowa State College, Ames, Iowa

percent rise in income, consumers may spend more than 1 percent — sometimes as much as 2 percent — on many items such as health, recreation, education, transportation, housing and home furnishings. As incomes continue to grow consumers "invite" (by their spending) the use of more resources in these industries. Because consumers want these things so much they handsomely reward the resources used in these industries.

The effect on agriculture is different when food is plentiful. When consumers' incomes increase by 1 percent, they increase their spending for food by much less than this. And most of this increased spending doesn't go for more food in total. It goes mostly for improved diets and food services, including freezing, packaging, additional processing, restaurant services, etc., rather than for more pounds of food per person. Some shift in the quality of products eaten takes place, but it mostly replaces other products or other qualities.

The main opportunity for *agriculture* to expand has been *with* and *at the rate of population growth*. Certain other industries such as those mentioned, can expand profitably at a much faster rate. *Both* population and national income growth set the pace for them. But, without important new markets, population growth alone is the chief pacer for agriculture. If it produces more than can be absorbed by population growth, agriculture generally finds itself with too much output, surpluses and lowered prices.

This is in distinct contrast to certain nonfarm industries which can absorb productivity gains which exceed population growth. They're rewarded also by national and per-person income growth as consumers actually increase their spending for the goods and services offered.

Farm production has increased much more rapidly than has the demand for it arising either from (1) population growth or (2) increasing consumer incomes. This is the heart of the long-run problem of agriculture in the United States.

Mechanization and improved production techniques, meanwhile, also have made it possible for fewer persons to produce this increasing output. During World War II and the years following, we experienced an unprecedented, almost explosive, adoption of new technology on the nation's

Do you think silver dollars are out of style? There are 488,650,000 in circulation.

farms. The demand for farm products tapered off following the war. But the pricing structure after the war continued to encourage output and increased use of new technology by making both unusually profitable relative to actual demand.

Agriculture has already made some changes because of this situation. Over 1939-50, the number of commercial farms in the nation dropped by 27 percent, and the average size of commercial farms increased by about 50 percent. The number of persons employed in agriculture declined by 25 percent in this same period and dropped another 25 percent during the 1950-58 period.

The United States has 133 practicing physicians for each 100,000 people.

Surplus Stocks . . .

The immediate short-run problem is our mammoth surplus stocks of wheat, feed grains and cotton. While this short-run problem is "part and parcel" of the long-run problem, it's not entirely the same problem. The changes that are taking place in response to the long-run problem offer no immediate promise of solving the short-run surplus problem.

Currently, as some operators leave the farm for opportunities elsewhere, their farm usually is consolidated with that of a nearby neighbor. And, as it turns out, the operator remaining often has more capital and the management ability to get greater yields.

Likewise solving the present problem of surplus stocks won't automatically solve the long-run problems of agriculture stemming from national economic growth.

Insurmountable? . . .

We're all pretty much aware of the size of the short-run surplus problem. The carryover of feed grains at the end of this year is predicted to total 70 million tons — compared with a "normal" annual carryover of 20 million tons and an average annual use over the last 5 years, including exports, of 130 million tons.

With corn acreage uncontrolled and average weather (and considering also that wheat stocks have some feed-grain potential), our grain stocks at the end of next year will be nearly as large as the normal usage of all feed grains in an average year.

Considering the size of current stocks, it's easy to think that our first and most pressing problem is to reduce the size of these stocks. It is and, at the same time, it isn't. There's an even more pressing problem: *To stop*

adding to these stocks.

Let's face it. There's no "magic" way to reduce these stocks immediately. At best, it would take several years to work the stocks down to a reasonable level. But to do this, even over a period of years, means that we'd have to stop adding to the stocks.

We've all hoped to find some easy and workable formula to expand demand or to improve market outlets for getting rid of our surpluses. But no such magic formula exists!

Surplus stocks now are six times greater than the record 1957-58 rate of feed-grain exports. And we can't expand domestic demand for feed grains to remove the surplus rapidly. People can't eat the feed grains unless they're processed through livestock. But, if we increased livestock production enough to eat up the surplus in 1 or 2 years, livestock prices would be highly unprofitable.

So it seems that the best opportunity is in stopping additions to the feed-grain surplus, and then, in using all of the methods at our disposal to reduce the surplus stocks over a 5- or 6-year period.

Can it Be Done? . . .

Could this be done? We'd need to work out a "timetable" for any such attempt. Let's "try one on for size."

It's too late to do anything about the problem in 1959. With average weather, stocks will increase because there are no controls on corn acreage. Thus, the first chance to put any machinery in operation to cease adding to stocks would be in 1960. Needed then would be a vigorous program to keep annual production from exceeding annual use.

They married, hoping their ship would come in. It turned out to be a raft — of children.

With the very large stocks on hand, acreage might well be reduced to a point where production would fall somewhat short of annual use. This operation would have to be continued for 4-6 years while: (1) We use every means possible to expand markets and to use up the excessive stocks now on hand; and (2) we use these years to make a transition to a more reasonable long-run structure of the national agricultural producing plant.

What Method? The first important step would be to decide on an acceptable method to cut back production, say, in 1960. Unless we do so and get it into action, we'll add even more to a stockpile of grains that's going to be tremendous by next year. And we can't even begin to make

physical arrangements before 1960 to use up stocks.

Even if it were to be fed in a short time — a possibility that's remote and probably undesirable on a "quick-tempo" basis — we could not get more sows bred and more cattle into the feedlot until next year. And, even if we were able to export it all in 1 year (a possibility even more remote and harmful to foreign relations), we couldn't get the machinery cranked up to do a complete job in less than a year.

The suggested first step is to stop adding to stocks which are already very large — *because it can cost considerably less to pay for* not *producing than to pay for producing and to pay for the storage costs in addition.*

Man has mastered all wheels except the steering wheel.

Producers participating with present price supports and whose grain moves into government-held stocks still pay their production costs. They get some returns on the crop but also bear, along with the public in general, the storage cost. These, like the surplus stocks, have been increasing annually. There are ways, however, in which production could be reduced — with payments large enough to provide about the same returns as under the present system — but without also having to cover *either* the *costs of growing or storing* the crops.

There are a number of ways this could be done. Some have suggested rigid production quotas. But it's an open question whether such a system is acceptable in our society. Another possibility is to apply an old principle — that of "supply and demand."

Experience from the past — whether for hogs, chickens, corn, milk or other farm products — has shown that if the price of a thing is high enough, the supply also will be high enough. This same principle would work in production control: If a high enough price is paid, the "supply" of land going out of production also will be large enough.

A high price? Higher than the current levels designed to do a part of this job. But the *total cost* probably would be *considerably less* than the current public outlay needed (1) to pay some farmers to take some land out of production, though not enough to eliminate the surplus buildup; (2) to provide support prices to others for producing more and offsetting the land taken out of production; and (3) to pay for storing the added surplus production.

Avoid "Won't Work's": We know that the old methods of acreage control won't do the job. They haven't taken enough land out of production: (a) to make up for the trend in increased yields; (b) to offset the tendency for the lowest-yielding land to go out of production first; and (c) to offset the tendency for farmers to take out part of their acreage and then to more than make up for it by using the "released funds" to get a greater output from the remaining acres.

Many producers enter parts of their farms in the acreage-control programs and then offset the acreage cut by using more fertilizer and better practices on the land that's left in production. And, in total, the acreage-control programs of the past have, in the main, merely shifted the relative surplus production from one crop to another. Producers, in effect, were asked to reduce the output of one surplus crop but allowed to shift production to other surplus crops.

Parts of the wheat and cotton surplus problems have been shifted to feed grains in this way. During 1945-49, for example, 76 million acres of wheat, 22 million acres of cotton and 164 million acres of feed grains, including soybeans, were produced. Over the 1954-58 period, we produced 58 million acres of wheat, 16 million acres of cotton and 174 million acres of feed grains.

The Great Plains area cut wheat acreage, but increased the acreage of feed grains. The South reduced cotton acreage, but diverted some of the acreage into feed grains. And even the Corn Belt and the Lake States increased feed-grain acreage between 1945-49 and 1954-58 as producers shifted away from corn into soybeans and grain sorghums.

Many a gal will scream at the sight of a mouse, but climb into a coupe with a wolf.

Attack Both Problems? In the short run, acreage might be taken out of production "across the board." The present "whole-farm" approach to land retirement provides some machinery for accomplishing this. But it might be necessary to extend such machinery to the limits allowed by community considerations and to spread it over more acres than at present.

A different system of land retirement would be needed in the long run, however. In this case, it would be better to withdraw land by regions where a permanent shift is needed in agricultural production and resource use.

If agriculture is to be meshed with national economic growth and the real social challenges that lie ahead, it will be necessary to concentrate more on leaving in production the land with the greatest comparative advantage in productivity of capital and manpower — with less production where the comparative advantage is lower.

Thus, some of the land which needs to be or might be taken out of production to meet the immediate surplus situation wouldn't be the same as that needed to meet the long-run growth and productivity problem.

Needed first, however, is thinking and action so that we can *stop adding* to the surpluses each year. And this is needed quickly. Then, the next 5 years, or whatever period is necessary, can be used to reduce existing stocks through whatever gains can be made in demand and market expansion.

Estrogens Boost Gains, Feed Efficiency

Beef heifers implanted with estrogens increased their weight and feed efficiency in experiments conducted by Purdue University animal scientists.

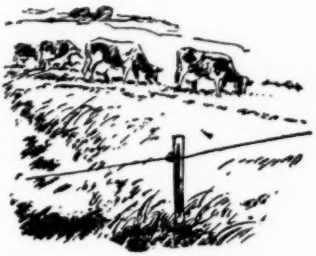
The researchers found that implantation of 36 mg. of diethylstilbestrol, 20 mg. of estradiol plus 200 mg. of testosterone or the feeding of 50 mg. of methyl testosterone daily in combination with 36 mg. implant of diethylstilbestrol increased total gains approximately 20 percent and reduced feed requirements per unit of gain about 14 percent.

An implant of two natural hormones, estradiol and testosterone, produced excellent gains and feed efficiency, but was not significantly superior to the diethylstilbestrol implant.

The use of a paste-type implant containing three natural hormones, estradiol, testosterone and progesterone, improved gain and feed efficiency, but was not quite equal to the other hormone treatments.

Details of the experiment, just concluded, are available in Mimeo AS-253, which may be obtained by writing the Agricultural Publications office, Purdue University, Lafayette, Ind. —*Purdue News*

"We Want More Milk... Not More Cows!"



New facts to help you decide whether to expand, or concentrate on improving your cows . . .

Condensed from Farm Journal

Bill Hardy

GET big or get out" is a slogan you hear in dairy circles everywhere these days. And a lot of farmers are following it — putting in 1,000-gallon bulk milk tanks, 16-cow milking parlors and building up herds of 100 cows or more.

Well, I've just visited a dairyman in Erie County, N. Y. who makes me want to rewrite that slogan, or at least add to it. I'd change it to "Get good or get out."

Paul Schintzius has only 36 Holstein milkers in his herd. Yet last year he produced 626,760 pounds of milk.

That's more from 36 cows than most 70-cow herds produce — and as much as you would get from 100 cows producing at the U. S. average. His herd average last year was 17,410 pounds of milk and 637 pounds of fat!

And look at King View Francy Allegra, the pride of the Schintzius herd and newly crowned champion of all breeds on two-times-a-day milking.

- She produced 38,672 pounds of milk and 1,239 pounds of fat in 365 days. That's an average of over 50 quarts a day.
- She produced 138 pounds on her high day — 80 pounds at one milking.
- She has produced 176,000 pounds of milk in her last six lactations — and over 30,000 pounds of milk in two of her last three.

Schintzius has a few other milkers that most dairymen would trade their new barn for. One 12-year-old has finished up her year with 25,560 pounds of milk and 948 pounds of fat. And another has cleared 24,000

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pounds of milk and 954 pounds of fat.

Perhaps the best description of the herd was made by Mrs. Schintzius. When I asked if they had any other really outstanding cows besides Francy, she said "Yes — 35 of 'em!"

Paul Schintzius didn't develop this herd just to get his name in the record books. He set his sights on higher per-cow production for the same reason many other dairymen aim for bigger herds: *to make more money.*

"We don't want more cows," he says simply, "We just want more milk."

A recent study of dairy production costs made by Purdue University will help illustrate what he means.

They found that 49.4% of total costs go for feed; 23.6% for labor; 5.1% for buildings; 1.7% for equipment; 3.7% for interest; 1.5% for taxes; and 15.0% for other things. Using this breakdown with typical costs and milk prices, here's how many cows you'd need to make a labor return of $3,700, if they produced at these four different levels:

6,200 lbs. milk per cow	131 cows
7,500 lbs.	57 cows
10,000 lbs.	27 cows
12,500 lbs.	18 cows

Schnitzius's barn and equipment aren't impressive — in fact he still hand-carries a lot of feed. But by concentrating on high-producing cows, he also has one of the highest milk-per-man averages that you'll find.

He made that 626,760 pounds of milk last year with the help of just one young farm hand for 10 months of the 12. So Paul himself could probably take credit for 400,000 pounds.

Of course, you have to remember that 36 cows make him larger than average to begin with. Two herds out of three in New York have less than 30 cows.

And Cornell economists say their records show "a strong relationship between herd size and income." They're telling New York dairymen that 40 to 50 cows are "easily within your reach."

Argentina is second to U. S. in annual volume of corn produced.

Paul Schintzius doesn't minimize the importance of management, but he does disagree with those who say that feeding and management are 80% of the dairy success formula.

This has been his philosophy right from the day he started in dairying on his own in 1945.

Paul wasn't raised on a farm. He farmed with others first to

get experience. Then when he was ready, he had to decide, like a lot of other young farmers, where to put his limited finances. Should he buy good cows and perhaps not so good a farm? Or should he put his money in high quality land and buildings.

Schintzius took the first course. He bought five really good cows first thing — and 10 commercial cows "just to get the milk."

Today, all of the best cows in his herd trace back to those original five. So do four bulls in the New York Artificial Breeding Association and two in the Mississippi ABA.

Leaves make a good base and a good start toward compost heap. Save the leaves, don't burn them.

"We breed to get the best animal we know how — and feed to take advantage of the breeding," he explains.

His feeding program may surprise you. He has concentrated on grassland farming; making certain he has plenty of top-quality hay.

He fills his two 14' x 50' silos with grass silage first, then everything else goes into hay.

His 300-acre farm is located on top of a hill — but the clay loam land is cold and wet. "We don't get a good corn crop one year out of four," he explains. "So grass silage makes more milk than corn silage for us."

"We have a standard grass mixture for the whole farm," he goes one — "birdsfoot trefoil", Narragansett alfalfa and Climax timothy."

He rotates his fields, using 12 different 4-acre sections to keep his herds on fresh pasture. Then he keeps the pastures clipped and fertilizes once each summer.

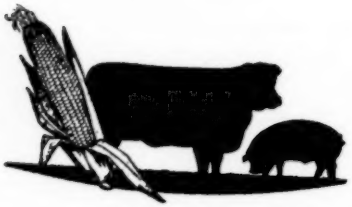
For concentrates, he makes a 14% ration using a commercial supplement with his own oats and barley — buys shelled corn and molasses to round out his feed supply.

Schintzius now has his sights set on selling breeding stock — thinks that the biggest gains to be made by herds in the future will come mostly from breeding.

"I think we'll see some 20,000-pound herd averages before too many years," Paul says. "After all, when I started out just 14 years ago, a 500-pound fat average was really something."

Fertilizer use has reached an all time record — 24 million tons in the year ended June 30, 1959. This is about 8 per cent more than the previous year.

Heat Dried Corn Good Cattle Feed



Trials show no nutrient loss, no decrease in digestibility . . .

Condensed from Nebraska Experiment Station Quarterly

D. C. Clanton and *M. L. Hemstrom*

As a result of recent developments in grain drying equipment, high moisture corn is being heat dried to safe storage levels.

This practice is becoming so widely accepted that heat dried corn may constitute a large part of the available market supply of corn in the future.

Since corn is a high energy livestock feed, the question of the effect of heat on its nutritive value is important. This was especially apparent following the 1957 harvest. Farmers received price cuts on heat dried corn. Some cattle feeders refused to buy heat dried corn thinking that its nutritive value had been reduced.

The following problems arise in determining the nutritive value of heat dried corn: differences in drying methods may have varying effects on the nutritive value of corn; high moisture immature corn may react differently when heated than relatively high moisture mature corn, and difference in moisture content at the time of drying may produce varying effects.

The actual value of ingested nutrients (dry matter, protein, energy, etc.) depends upon the use which the body is able to make of the nutrients. The consideration is digestibility, since undigested nutrients are not absorbed from the digestive tract. Group feeding trials, in which nutrient effects are measured by feed efficiency records do not reflect good measures of digestibility. This can only be done with digestion trials.

Digestibility Trials

Digestion trials were conducted during 1958 at the Nebraska Agricultural Experiment Station to determine the digestibility of beef cattle rations containing artificially dried corn.

Four yearling steers and 4 rations containing corn, which had

Reprinted from Nebraska Experiment Station Quarterly,
University of Nebraska College of Agriculture, Lincoln 3, Nebraska

been dried artificially under various temperatures, were used in the trials. The trials involved both growing and fattening phases. The digestibility of each ration was measured by each steer in a rotation design. The nutrients consumed and the nutrients excreted were measured. The nutrients remaining in the body were the digested nutrients. The digested nutrients, expressed in per cent of the nutrient intake, are referred to as the digestion coefficient.

Cattle numbers in Brazil and Argentina combined (110.6 million) total substantially more than in the U. S. (about 97 million), yet their annual beef production is only half as large as ours.

—Cow Business

Corn used in the experiment contained approximately 25 per cent moisture on the ear when purchased. After shelling and just before artificially drying, the moisture content was 20.4 per cent.

Control corn (Ration 1) was dried to 13 per cent moisture with unheated forced circulating air. The corn dried with heat was dried in a Cambell re-circulating dryer. Air flow rates were not measured or varied in this experiment. Corn drying times and temperatures are shown in Table 1.

During the growing phase, ground corn was fed with chopper alfalfa at the rate of 9 pounds of alfalfa and 4 pounds of corn per day. During the fattening phase, corn was increased to 13 pounds per day and alfalfa reduced to 5 pounds per day. The alfalfa hay was coarsely chopped.

Results

The digestibility coefficients for all nutrients except protein were higher during the fattening phase than during the growing phase (Table 2). This is explainable because the fattening rations contained 72 per cent corn and the growing rations contained 31 per cent corn. The remaining percentages were alfalfa hay. Nutrients in corn are more digestible than nutrients in alfalfa hay.

The possible reason for the decreased digestibility of protein in the fattening ration is that with the increased feed intake an excess of protein was being fed. Digestibility of nutrients will be lower if the nutrients are fed in excess of their need. This indicates that with the possible exception of protein the nutrients in the fattening ration were not being fed in excess of the animal needs while being fattened.

TABLE 1. Temperature and Drying Time Used in Drying Corn.

Ration	Initial Moisture	Moisture After Cooling	Air Temperature Entering Dryer	Drying Time
	%	%	Degree F.	Hours
1	20.4	13.0	Unheated[1]	168.0
2	20.4	13.4	130	7.50
3	20.4	12.2	160	6.75
4	20.4	13.6	190	5.50

1 The temperature during the week of natural drying averaged approximately 60°F.

TABLE 2. Average Digestion Coefficients Due To Ration Differences.

	Growing Phase				Fattening Phase			
Ration No.	1	2	3	4	1	2	3	4
	These columns based on percentages.							
Dry matter	65.5	65.5	65.2	65.0	71.7	71.1	70.3	69.8
Organic matter	66.5	66.3	66.3	66.1	72.9	72.2	71.5	70.7
Crude protein	65.1	65.0	65.6	65.0	59.5	57.2	58.1	58.4
Ether extract	53.7	58.5	58.4	55.8	66.5	68.1	73.0	69.1
Crude fiber	39.2	36.6	33.3	33.8	46.7	40.6	40.4	40.7
Nitrogen-free extract	81.3	81.6	81.8	81.3	79.7	79.9	78.1	77.6
Energy	63.2	63.8	62.9	62.6	71.6	71.4	69.1	70.2

No significant difference was observed in the digestibility of any of the nutrients in the four rations in either the growing phase or the fattening phase of the experiment (Table 2). Animal differences accounted for most of the variation in the digestion coefficients.

Artificial drying of the corn used in the rations had no effect on the chemical composition of the rations. The chemical composition of the corn dried with different temperatures was similar.

No special study of palatability was made in this experiment; however, there were no refusals of the rations, indicating they were palatable. The color and appearance of the corn was not altered by drying. Reports of cattle refusing to eat heat dried corn are understandable if the corn was scorched during improper drying.

Under the conditions of this experiment, it can be concluded that there is no nutrient loss in corn due to artificial heat drying, or decreased digestibility of the nutrients in rations containing the corn.

Further Research Needed

Results of this experiment do not reveal information on differences in procedures for drying

corn. It has been reported that there is an association between moisture content, drying temperature, and nutrient loss in artificially dried corn. The critical point in this relationship has not been determined; however, it would appear that the lower the moisture content of the corn, the higher the temperature that can be used without altering the nutritive content of the corn.

It is possible that corn containing different moisture contents should be dried under different conditions. The relationship of temperature, drying time, and air flow rate of the heated air would constitute factors involved in the different conditions necessary for drying corn with varying moisture contents. There is need for more research information from which standard procedures could be worked out for drying corn under different conditions.

'This, Children, Is A Cow'

It will come as a surprise to those adults who remember childhood companionship with calves, colts, lambs and other farm animals to learn that play farms are now being opened near large cities to give city children introduction to such strange animals as cows.

Since only about 12% of the American population now lives on farms, most city children are acquainted only with zoo animals and with park pigeons and squirrels.

The cow, particularly, is a stranger.

When asked where milk comes from, city children often reply, "From the milkman."

At these play farms children can see the milking of cows and can feed and play with smaller animals.

Such experience probably will seem tame indeed to that rapidly diminishing number of Americans who have had the adventure of finding a wobbly calf in a pasture, of carrying in a baby lamb, of trying to hold a mettlesome colt on a rope, of being chased by an angry turkey gobbler, of living with a geometric progression of kittens from haylofts.

A synthetic farm life nevertheless is better than none, and it is well that the next generation will at least know that cows are not purple.

—*The Milwaukee Journal*

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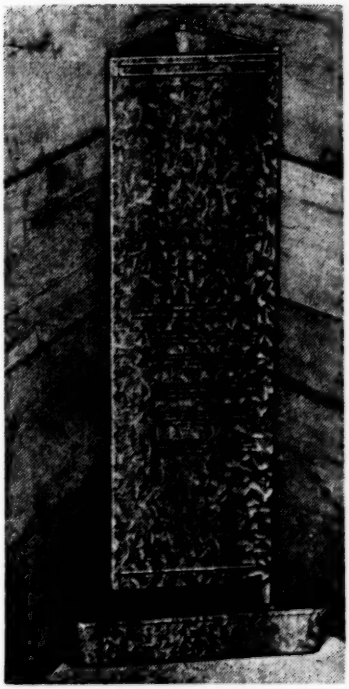

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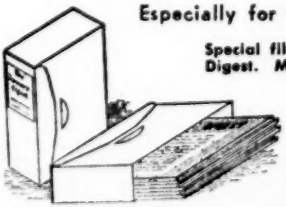

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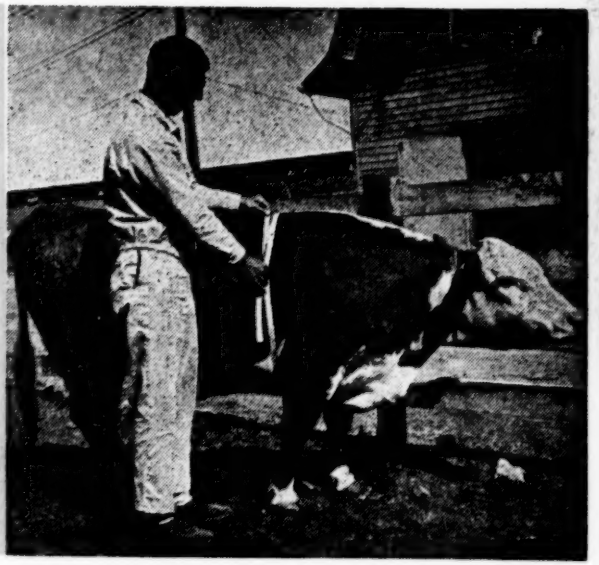
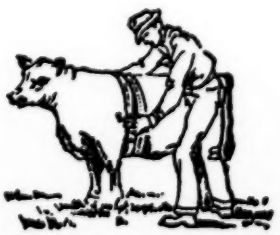
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